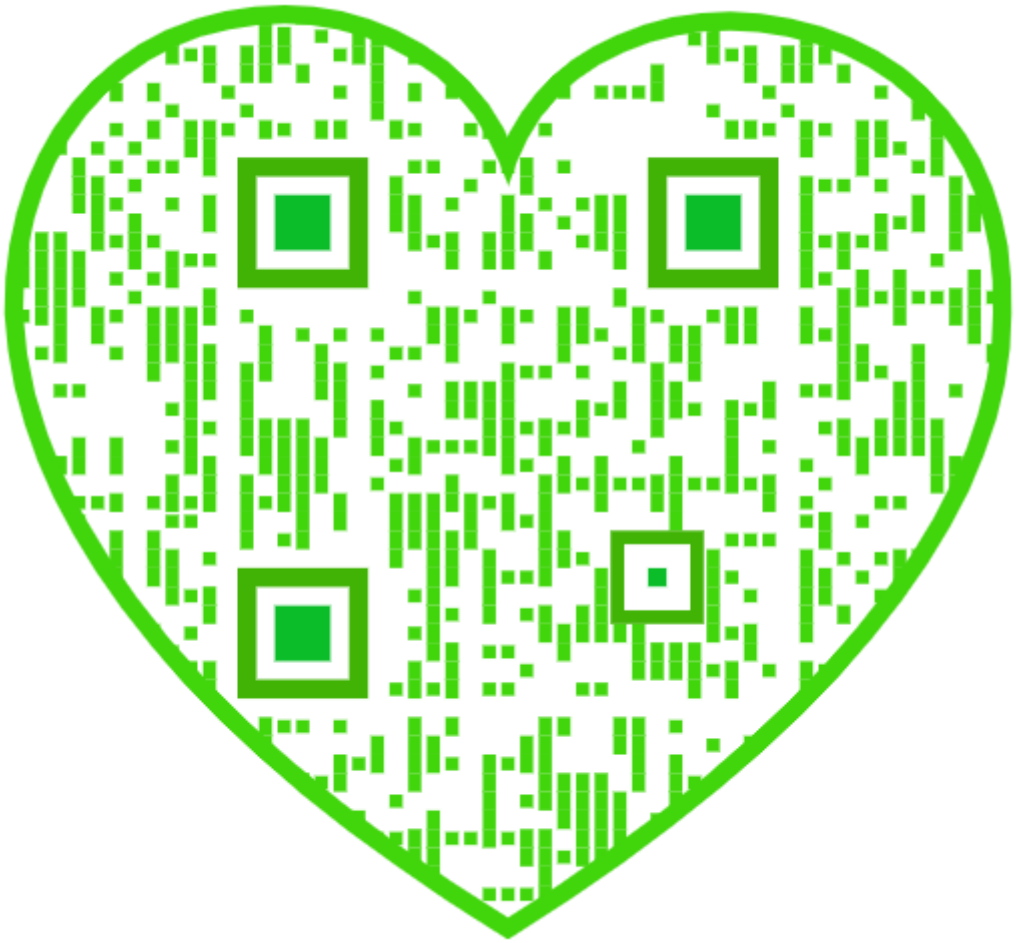


Class RG951
Book .C7
Copyright No. 1903

COPYRIGHT DEPOSIT.

A NURSE'S HANDBOOK

OF

OBSTETRICS

FOR USE IN TRAINING-SCHOOLS

BY

JOSEPH BROWN COOKE, M.D.

FELLOW OF THE NEW YORK OBSTETRICAL SOCIETY, ETC.

Fourth Edition, Revised

PHILADELPHIA AND LONDON

J. B. LIPPINCOTT COMPANY

RG 951
.C7
1909

Copyright, 1903, by J. B. Lippincott Company

Copyright, 1905, by J. B. Lippincott Company

Copyright, 1907, by J. B. Lippincott Company

Copyright, 1909, by J. B. Lippincott Company

248612

PRINTED BY J. B. LIPPINCOTT COMPANY, PHILADELPHIA, U. S. A.

To

DOCTOR M. IMOGENE BASSETT

IN SINCERE APPRECIATION OF HER HIGH
PROFESSIONAL ATTAINMENTS AND WITH
THE WARMEST REGARDS OF THE AUTHOR

THIS BOOK

IS MOST GRATEFULLY INSCRIBED

PREFACE TO THE FOURTH EDITION

In revising this book for its fourth edition the author can only renew his thanks to the many friends that it has made.

The work has been most carefully reviewed and such changes as seemed necessary have been made in the text.

J. B. C.

New York, October, 1909.

PREFACE TO THE FIRST EDITION

This book was written to supply a need that has long been felt in the Training-School for Nurses with which the author is associated, and one which has doubtless been experienced in other institutions of the same character.

The trained nurse of to-day devotes not less than two, and usually three, years of her life to the study of her profession, a period of time which, until recently, was regarded as sufficient for the medical student to gain all the knowledge necessary for the acquisition of his diploma as a fully qualified physician and surgeon.

In spite of this, there are few if any strictly technical text-books written expressly to meet the requirements of the pupil-nurse. She has, of course, her works on "Nursing," but when she takes up the purely medical or surgical side of her subject, as she must to a certain and not very limited extent if she is to perform her duties thoroughly and intelligently, she is obliged to turn for her information to books written solely for the use of physicians and medical students, and filled with incomprehensible technicalities and confusing statistics and discussions.

This makes the training of the pupil-nurse a problem of considerable difficulty not only to herself, but to her teachers and other instructors, and in the matter of obstetrics the condition of affairs seems to be especially marked.

The book-shops are filled with small volumes on "Maternity Nursing," "The Hygiene of Pregnancy," and similar subjects, but practically all of these works are written with a double pur-

pose, and are so worded and arranged that they can be used by the prospective mother herself as well as by the nurse. Between these short, incomplete, and purposely "popular" books and the strictly medical work, there is nothing to which the nurse can appeal for information; and the present volume is offered as a means of filling in the gap. It is intended to contain all of the science and art of obstetrics that a nurse need know in order to practise her profession in an intelligent manner consistent with her position as a scientifically educated woman, combined with a clear exposition of the principles and practice of maternity nursing. Statistics, discussions, and unsubstantiated theories have been entirely omitted, and an effort has been made to present the subject-matter in a way that will be perfectly clear to the beginner in the study of nursing.

It has been suggested to the author that a book written on the plan of the present volume would have a tendency to over-educate the nurse and make her feel that in point of knowledge she stood on an equal plane with the physician. The absurdity of this contention is based upon its inherent inconsistency, for

"A little learning is a dangerous thing,"

and education and intelligence are the best and surest safeguards against insubordination and usurpation of authority.

The lieutenant never questions the word nor criticises the action of his captain or colonel, yet both are educated on precisely the same lines; but the private, who knows nothing of the science of war, and is required to work blindly and unquestioningly, is constantly ventilating his ideas and lamenting the ignorance of his superiors to any one who is foolish enough to listen.

Repetitions in the book are frequent and intentionally so. Details are treated with the utmost minuteness, and the Glossary

contains many words not to be found in the text but included to facilitate collateral reading and the understanding of occasional remarks made by physicians.

The profusion of illustrations, of which seventy-six are original and were made especially for this work, adds greatly to the practical value of the book and has been rendered possible by the generosity of the publishers, whose unfailing courtesy and assistance at all times is most highly appreciated by the author.

The author wishes also to express his thanks and acknowledge his indebtedness to Miss Mary S. Gilmour and Miss Theodora H. LeFebvre, the Superintendent and Assistant Superintendent of the New York City Training-School for Nurses, who have most kindly read the manuscript and made a number of valuable corrections and suggestions, and to Dr. G. E. McCartney, who has aided him materially in various ways.

J. B. C.

240 West One Hundred and Thirty-eighth Street, New York.

March 10, 1903.

CONTENTS

CHAPTER		PAGE
I.	Introduction	19
II.	The Pelvis	22
III.	The Female Organs of Generation	28
IV.	Ovulation and Menstruation	37
V.	Fetal Development	43
VI.	The Physiology of Pregnancy	62
VII.	The Disorders of Pregnancy	71
VIII.	The Signs and Symptoms of Pregnancy	98
IX.	The Management of Pregnancy	105
X.	The Nurse's Outfit	119
XI.	The Patient's Outfit	123
XII.	The Mechanism of Labor	129
XIII.	The Phenomena of Labor	139
XIV.	Preparations for Labor	144
XV.	The Conduct of Labor	152
XVI.	Operative Delivery	177
XVII.	Accidents and Emergencies	201
XVIII.	The Physiology of the Puerperium	224
XIX.	The Management of the Puerperium	228
XX.	The Disorders of the Puerperium	248
XXI.	Abortion and Miscarriage	261
XXII.	The Care of the Normal Infant	271
XXIII.	The Premature and Feeble Infant	285
XXIV.	The Accidents, Injuries, and Diseases of the New-Born	299
XXV.	Infant Feeding	310
XXVI.	Maternal Impressions and the Control of Sex	343
	Key to Pronunciation	347
	Glossary	349
	Index	387

LIST OF ILLUSTRATIONS

FIGURE		PAGE
1.	The normal female pelvis	22
2.	The pelvic inlet	24
3.	Male and female pelvis	25
4.	Female pelvis deformed by osteomalacia	26
5.	Harris's pelvimeter	26
6.	Measuring the distance between the crests of the ilia	26
7.	Internal pelvimetry	27
8.	External organs of generation	28
9.	Internal organs of generation	30
10.	The internal organs of generation, seen from above	31
11.	The uterus and its appendages	31
12.	The cavity of the uterus	32
13.	Ovary and tube of a girl twenty-four years old	34
14.	Mammary gland of a woman during lactation	35
15.	Longitudinal section through ovary of a woman twenty-two days after the last menstruation	37
16.	Longitudinal section of ovary of a woman on the first day of menstruation	38
17.	Human spermatozoa	43
18.	First stages of segmentation of the ovum of a rabbit	44
19.	Uterus with decidua in beginning pregnancy	46
20.	Normal position of fœtus in utero	47
21.	Fetal surface of the placenta	49
22.	Maternal surface of the placenta	49
23.	Human ovum at the end of the first month	50
24.	Outline of human embryo of about four weeks	51
25.	Human fœtus at the end of the third month	51
26.	Skeleton of infant at term	52
27.	Fetal skull, side view	54
28.	Diagram of circulation after birth. Adult type	57
29.	Diagram of circulation before birth. Fetal type	58

FIGURE PAGE
30. Striæ gravidarum, or Lineæ albicantes 63
31. The breasts of pregnancy 66
32. Abdominal pigmentation 68
33. Varicosities of the lower extremities 77
34. Ectopic gestation 93
35. Placental attachment 95
36. Marked pigmentation of breast 101
37. Size of the uterus at each month of pregnancy 103
37*a*. Berthé May's maternity corset 106
38. Operating gown and case 119
39. Proper costume for obstetrical nurse 120
40. Scales and hammock for weighing infant 121
41. Vertex presentation 130
42. Flexion of head during second stage 132
43. Extension of the head in anterior presentations of the vertex 133
44. External rotation 134
45. Internal rotation and extension 135
46. Shape of head of child born in face presentation 136
47. Shape of head of child born in brow presentation 136
48. Face presentation 136
49. Breech presentation 137
50. Prolapse of arm in transverse presentation 137
51. Bassinette 146
52. Preparation of bed for labor. First stage 148
53. Preparation of bed for labor. Second stage 148
54. Arrangement of bed, table, and chair for normal labor 150
55. Arrangement of sheets for vaginal examination 156
56. Vaginal examination 156
57. Kelly pads 157
58. Beginning of second stage of labor. Patient bracing against chair and pulling on sheet at the height of a pain 159
59. Esmarch outfit for the administration of chloroform 159
60. Administration of chloroform 161
61. Administration of ether 164
62. Delivery of placenta in dorsal position 169
63. Holding back the head to prevent sudden expulsion 168
64. Infant suspended by heels. Nurse slapping its back to excite respiratory movements 169

FIGURE PAGE
65. Square knot 170
66. Granny knot 171
67. Delivery of placenta and membranes 172
68. Delivery of the head in breech cases 173
69. Arms extended in breech delivery 175
70. Locked twins 176
71. Internal version 177
72. Combined or bipolar version 178
73. Lithotomy position 179
74. Forceps applied to head at brim 181
75. Walcher posture 181
76. Elliott's forceps 182
77. Simpson's forceps 183
78. Tucker-McLane forceps 183
79. Tarnier axis-traction forceps 183
80. Barnes's bags 185
81. Champetier de Ribes bag 185
82. Bulb and valve, or "Davidson" syringe 185
83. Bag in grip of forceps 186
84. Pelvic tumor preventing delivery 187
85. Kelly pad in position under patient 188
86. Sterile salt solution in flasks 189
87. Sponge made of cotton and gauze 189
88. Sponge-holder 189
89. Intestinal pad of folded gauze 190
90. Gauze packing 190
91. Galbiati knife 192
92. Scalpels 194
93. Needle-holder 194
94. Naegele's perforator 196
95. Braun's cranioclast 196
96. Tarnier's basiotribe 196
97. Impacted shoulder presentation 197
98. Braun's key-hook 197
99. Braun's hook applied 198
100. Long, blunt scissors. For decapitation and evisceration 198
101. Bougie for the induction of labor 199

FIGURE PAGE
102. Sims's position 200
103. Concealed hemorrhage 202
104. Rupture of the uterus 205
105. Complete inversion of the uterus 206
106. Prolapse of the umbilical cord 208
107. Knee-chest position 208
108. Trendelenburg position 209
109. Manual extraction of the placenta 214
110. Aspirating needle 220
111. Saline infusion under the breast 220
112. Figure-of-eight ligature. For controlling secondary hemorrhage from the umbilicus 222
113. Holding the fundus after delivery 229
114. Douche-pan 231
115. Fountain syringe 233
116. Teufel's abdominal supporter 235
117. Abdominal binder 236
118. Glass catheter 240
119. Proper method of inserting catheter 241
120. Method of withdrawing catheter 242
121. Proper method of introducing douche-tube 244
122. Massage of the breast 254
123. Nipple shield 255
124. Author's breast-binder 256
125. Pattern of author's breast-binder 257
126. Lithotomy position 263
127. Author's leg-holder 264
128. Robb's leg-holder 264
129. Sims's speculum 265
130. Schroeder's vaginal retractor 265
131. Bullet-forceps 265
132. Modified Goodell-Ellinger dilator 265
133. Uterine sound 266
134. Placenta-forceps with heart-shaped jaws 266
135. Curettes 266
136. Sponge-holder 266
137. Two-way catheter 267

FIGURE PAGE
138. Patient ready for curettage 269
139. Method of dressing the umbilical cord 273
140. Folding rubber bath-tub 274
141. Double wash-basin 275
142. Paper bags pinned together 275
143. Diagram of nursery 277
144. Lowering infant into bath 279
145. Infant's long clothes 281
146. Infant's night-gown 283
147. Pattern for improvised cotton jacket 288
148. Improvised turban of gauze and cotton for premature infant ... 289
149. Improvised cotton jacket, blanket, and turban 289
150. Infant premature at twenty-eighth week 290
151. Tarnier's incubator, exterior 291
152. Tarnier's incubator, interior 292
153. Hot-water jug 292
154. Premature infant properly attired 294
155. English breast-pump 295
156. Feeder for premature infant 297
157. Infant premature at thirty weeks 298
158. Facial paralysis of new-born child 301
159. Caput succedaneum 301
160. Double cephalhæmatoma 302
161. Thumb-forceps 304
162. Spina bifida of dorsal lumbar region 305
163. Spina bifida. Spontaneous cure 306
164. Hernia button 307
165. Method of attaching hernia button 307
166. Opisthotonos 309
167. Soft, flabby breasts 311
168. Two-ounce vial with nipple 313
169. Chapin dipper 330
170. The "Sloane Maternity" measuring-glass 333
171. Nursing-bottles 335
172. Testing size of opening in nipple 336
173. Steam-sterilizer 339
174. Freeman pasteurizer 339

A NURSE'S

HANDBOOK OF OBSTETRICS

I

Introduction

In a paper read recently before one of the great medical societies of New York the gynæcologist was styled "that obstetrical camp-follower," and this characterization may well serve as a text for a dissertation on obstetric nursing.

Practically all women who consult the gynæcologist are married, have borne children, and date their troubles from the birth of one or another child, and it is safe to say that the comparatively few unmarried women who seek advice for the relief of pelvic disorders would be in infinitely worse condition than they are if they had passed through the ordeal of pregnancy and labor.

The amount of good for womankind that nurses can accomplish by the dissemination of judicious advice concerning the requirements of the pregnant state and by intelligent care of parturient and puerperal cases, probably exceeds in many ways the best efforts of the physician. Especially among primigravidæ does this hold true, for women who have never borne children are often remarkably diffident in regard to their condition, and unless the early symptoms of pregnancy are exceptionally severe, they will neglect to place themselves under medical care until much mischief may have been done.

When nurses, as a class, will impress upon women who may

come under their notice the importance, not only to themselves but to their infants, of consulting and implicitly following the directions of a skilful obstetrician as soon as they have reason to suspect that they are pregnant, they will save a large number of these patients many visits to the gynæcologist in after years.

A nurse can, with propriety, volunteer advice of this kind when a physician, taking the same stand, would often be unjustly suspected of ulterior motives, and her opportunities for doing so are greater than his in the exact proportion in which a woman will discuss a delicate subject with another woman more frequently and more freely than with a man.

Regarding nursing in the light of a noble profession, closely allied to that of medicine, no opportunity for aiding and permanently benefiting humanity will ever be overlooked, and scientific supervision of pregnancy, labor, and the puerperium can do more in this respect than all other branches of nursing combined.

As the writer has expressed in another place, let the pregnant woman be taken in hand at the very beginning of her pregnancy and put in condition to withstand the ordeal through which she has to pass, much as the athlete is "trained" for months before the encounter in which he is to figure.

It may be stated, as a general rule, that no woman should die or even be seriously invalided as a result of pregnancy if she is under proper care from the beginning of gestation, and it rests with the nurses of modern times more than with the physicians to see that every woman is afforded such care and attention as will insure the successful outcome of her case.

The key-note of success in obstetric practice lies in a thorough knowledge of the patient's exact condition long before labor occurs and in ample preparation for delivery and after care, so that the labor may be conducted with every attention to aseptic detail and modern surgical method.

Twentieth century civilization has done much to retard the physical development of women in general, and, among those who are in a position to afford the services of a graduate nurse, very few have sufficiently robust constitutions and normally de-

veloped pelves and generative organs to make labor and its after effects anything but a matter of considerable moment.

Unless the physician has been afforded an opportunity to build up their general health and keep a watchful eye on the behavior of their bodily functions, and unless the nurse has made careful and judicious preparations for conducting their labors in a thoroughly aseptic manner, complications may arise at the last moment which may result in permanent invalidism, if not in the death, of the mother or child.

Obstetric nursing presents many unattractive features, for after labor there are two patients instead of one to be cared for, but it offers so many and so great opportunities for the advancement of "preventive medicine" that the writer cannot but look with considerable disfavor upon that large and constantly increasing class of hospital nurses who regard maternity cases as entirely beneath their dignity and who leave these unfortunate patients in the care of unskilled attendants, only to nurse them afterwards when they reach the operating-table of the gynæcologist.

II

The Pelvis

The pelvis (Fig. 1) is that portion of the skeleton which lies between the spinal column and the lower extremities. It is

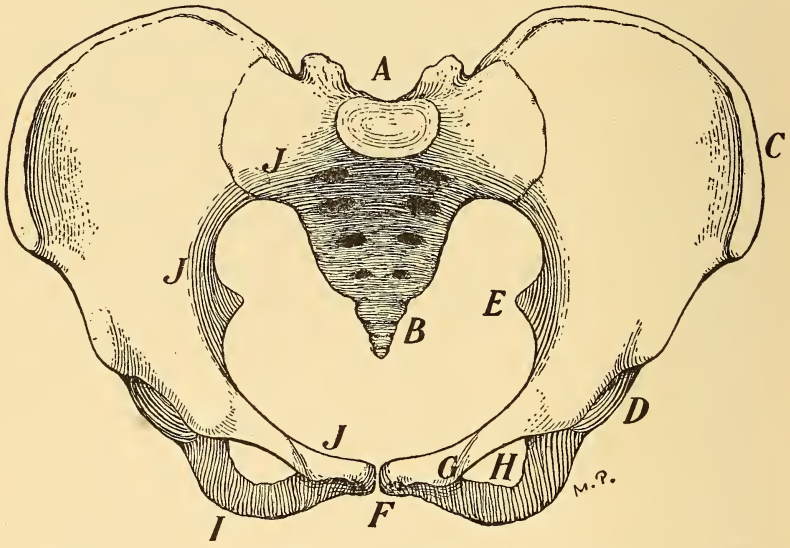


Fig. 1.—The normal female pelvis. (Garrigues.) *A*, sacrum; *B*, coccyx; *C*, crest of the ilium; *D*, acetabulum; *E*, spine of the ischium; *F*, symphysis pubis; *G*, spine of the pubis; *H*, obturator foramen; *I*, tuberosity of the ischium; *J*, *J*, *J*, linea terminalis.

composed of four bones,—the *sacrum* and *coccyx* behind, and the *innominate bones* (*ossa innominata*) at the sides and in front. Each *innominate bone* (*os innominatum*) is divided by anatomists into three parts,—the *ilium,* the *ischium,* and the *pubis.*

The *ilium,* which is the largest portion of the bone, is broad, thin, concave on its inner aspect, and lies above the narrow constricted portion of the pelvis. Like its fellow of the opposite side, it is joined to the sacrum behind, and its upper flaring

border forms the prominence of the hip, or *crest of the ilium,* commonly spoken of as the "hip bone."

The *pubis* joins directly in front, in the median line, with its opposite fellow, and closes, anteriorly, the cavity of the pelvis.

The *ischium,* which is that portion of the innominate bone lying beneath the ilium, is not of importance to the obstetric nurse, although it is of interest to know that it occasionally presents bony projections (*exostoses*) of sufficient size to obstruct the descent of the head during labor.

The *sacrum* is a triangular, wedge-shaped bone, consisting of five rudimentary vertebræ welded together, and lies at the back part of the pelvis, between the *ilia* (plural of *ilium*), closing in the cavity behind. Its upper surface, or base, is broad and flat, and supports the spinal column ("backbone") and with it the entire weight of the body. Its apex points downward and forward, and to it is attached

The *coccyx,* a very small triangular bone, resembling somewhat in appearance a miniature sacrum and being possibly the remains of a prehistoric caudal appendage, or tail.

Regarded as a whole, the pelvis may be described as a deep, bony basin resting on the upper extremities of the two *femora* (plural of *femur*), or thigh bones, and supporting the spinal column, which carries the weight of the trunk, the head, and the upper limbs. The flaring surfaces of the ilia make a sort of funnel to guide the fœtus into this basin, which, having no bottom, forms a bony canal through which the child has to pass at the time of labor.

The most constricted portion of the pelvis is called the *brim,* or *inlet* (Fig. 2), and is, naturally, of the greatest obstetric importance; for, as a chain is only as strong as its weakest link, so is a canal only as broad as its narrowest part, and, except in certain cases of deformity, any child that can pass safely through the brim can be delivered without any further difficulty.

The *brim* of the pelvis is bounded *behind* by that portion of the upper anterior surface of the sacrum, which projects farthest forward and is called the *"promontory of the sacrum;" on the sides* by the lower borders of the *ilia;* and *in front* by the two

pubic bones, which meet in the median line and form the "*symphysis pubis.*"

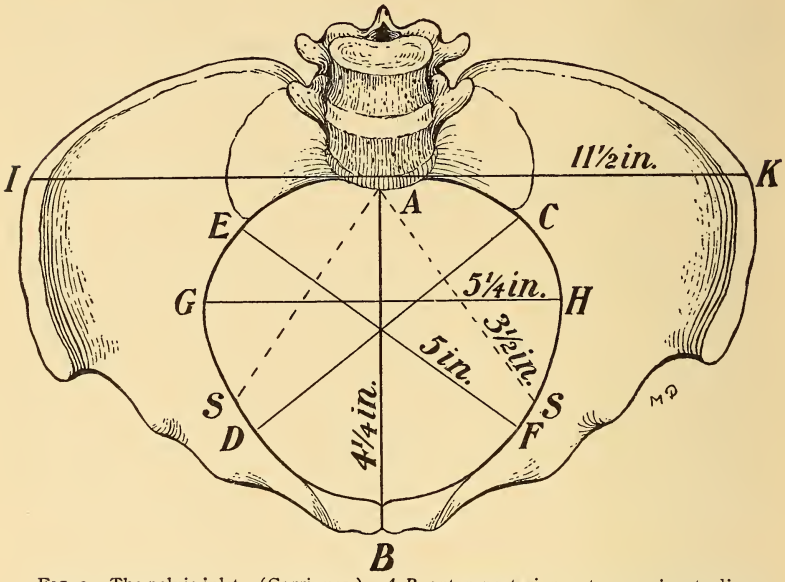


FIG. 2.—The pelvic inlet. (Garrigues.) *A B*, anteroposterior or true conjugate diameter; *C D*, left oblique diameter; *E F*, right oblique diameter; *G H*, transverse diameter; *A S*, sacrocotyloid distance; *I K*, crest of the ilium.

The *contour of the inlet* is more or less heart-shaped because of the jutting forward of the promontory of the sacrum, and *the most important diameter of the pelvis is the distance between the promontory and the symphysis.* If this is normal (ten centimetres, or about four and one-quarter inches), it is almost certain that the entire pelvis is normal, and that the child can be born without any serious difficulty.

The *articulations* (*joints*) of the pelvis, which possess obstetric importance, are four in number. Two are behind, between the sacrum and the ilia on either side, and are termed the *sacro-iliac synchondroses* (plural of *synchondrosis*); one is in front, between the two pubic bones, and is called the *symphysis pubis;* and the last, of little consequence, is that between the sacrum and coccyx,—the *sacro-coccygeal articulation.*

All of these articular surfaces are lined with fibro-cartilage, which becomes thickened and softened during pregnancy, and a certain definite, though very limited, motion in the joints is essential to a normal labor. Even an ankylosis of the sacro-coccygeal articulation, preventing the tilting backward of the coccyx at the time of delivery, may necessitate the use of forceps, and, in the operation of symphyseotomy, which consists in cutting through the symphysis pubis and so separating the pubic bones, no increase in the capacity of the pelvis could be secured were it not for a very distinct hinge-like motion at the sacro-iliac synchondroses.

The pelvis is lined with muscular tissue, which provides a smooth slippery surface over which the fœtus has to pass during labor, and its bones are bound together by ligaments, which become softened and slightly lengthened as pregnancy advances.

Comparing the female with the male pelvis (Fig. 3), we find that the former is especially adapted to the uses for which

FIG. 3.—Male and female pelvis. A, male pelvis—narrow, heavy, compact; B, female pelvis—broad, light, capacious.

it is designed. It is shallow, but very capacious, lighter in structure and smoother than the male pelvis, which is deep, conical, rougher for muscular attachment, and more compact.

The entire problem in obstetrics consists in the safe passage of the fully developed fœtus through the pelvis of the mother. Slight pelvic contractions, resulting in tedious or instrumental

deliveries, are comparatively common, while any such marked deformity as depicted in Fig. 4 would render labor by the natural

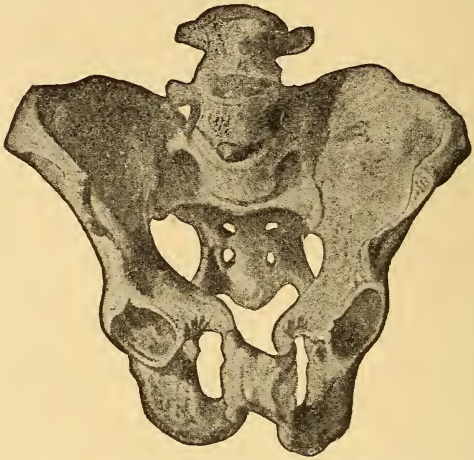


FIG. 4.—Female pelvis deformed by osteomalacia. (Garrigues.)

passages entirely out of the question. For these reasons the pelvis of every pregnant woman should be measured carefully at a sufficiently early date to enable the physician to determine definitely the proper course to pursue.

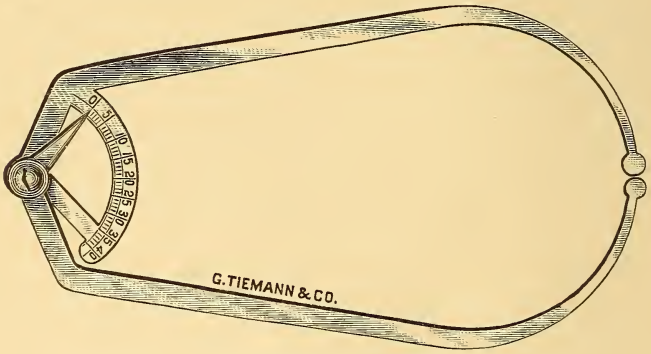


FIG. 5.—Harris's pelvimeter.

The *external pelvic measurements* are taken with an instrument called a pelvimeter (Fig. 5), which acts on the principle

FIG. 6.—Measuring the distance between the crests of the ilia.

of a carpenter's or plumber's calipers. The patient lies on her side or back, according to the diameters to be measured, with the abdomen exposed, as shown in Fig. 6. *The internal pelvic measurements,* for determining the actual diameters of the brim, are usually made by inserting two fingers into the vagina and up to the promontory of the sacrum and estimating the various dimensions in this manner (Fig. 7).

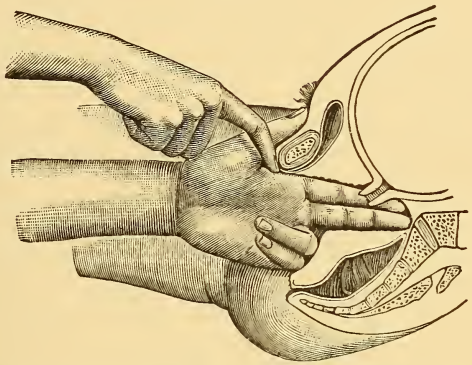


FIG. 7.—Internal pelvimetry. Measuring the distance between the promontory of the sacrum and the lower border of the symphysis pubis.

The importance of the knowledge gained through the skilful performance of external and internal pelvimetry cannot be overestimated, and it should never be neglected in the case of a woman pregnant for the first time nor in any case in which the patient has suffered previously from difficult or tedious labors.

In cases of slight contraction the induction of labor two or three weeks before term may be all that is necessary, while the existence of marked deformity may call for the performance of Cæsarean section as the only alternative. It is to be kept in mind that the higher we ascend in the social scale the more frequently do we encounter pelvic deformities of varying degrees, due to faulty development superinduced by lives of luxury and indolence, and that the class of patients coming under the care of the graduate nurse presents a far greater proportion of such deformities than is found among women in the lower walks of life.

III

The Female Organs of Generation

THE FEMALE ORGANS OF GENERATION are divided into two groups, the *external* and the *internal,* which are connected by the *vagina.*

The *external organs,* taken as a whole (Fig. 8), constitute the *vulva,* and consist of—

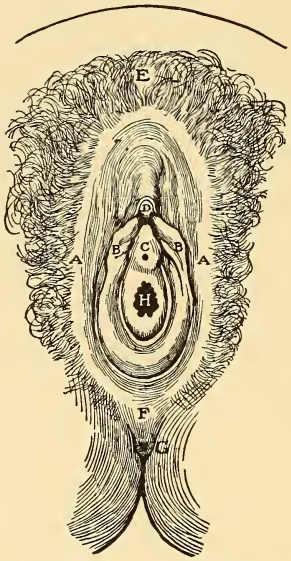


FIG. 8.—External organs of generation. A, A, labia majora; B, B, labia minora; C, meatus urinarius; D, clitoris; E, mons veneris; F, perineum; G, anus; H, entrance to vagina.

The *mons veneris,* a firm, cushion-like formation covered with hair and lying directly over the symphysis pubis.

The *labia majora,* or greater lips, made up of adipose tissue (fat) and covered externally with skin and hair and internally with mucous membrane. They begin in the median line at the lower border of the mons veneris and extend downward and

backward, on either side, to meet at a point termed the *fourchette,* which is almost invariably torn at the first labor.

The *labia minora,* or lesser lips, lie entirely within the vulva, except in the case of infants and of women who have borne children or are much emaciated. They are covered entirely with mucous membrane, and their upper extremities are divided into two parts, one passing above and one below (and so forming a hood for)

The *clitoris.* This is a small reddish tubercle situated about half an inch behind the upper and anterior junction of the labia majora.

The *meatus urinarius,* commonly spoken of as the "*meatus,*" is the external opening of the *urethra,* which is the canal (about one and one-half inches in length) leading to the bladder. The meatus lies directly back of the clitoris and about three-quarters of an inch from it. When the labia are separated it appears as a small dimple in the median line under the symphysis.

The *vagina* is a musculo-membranous canal, five to six inches in length, leading from the *vulva* to the *uterus* and lying wholly within the true pelvis. It is lined with mucous membrane, the secretion of which possesses marked germicidal properties. In consequence of this fact the vagina is always aseptic except in the presence of disease or very soon after direct infection from without, and for this reason a vaginal douche should never be given before labor unless it is specially ordered by the physician. Under ordinary circumstances such a douche can do no good, and it is certain to do actual harm by removing the natural and aseptic lubricant of the vagina, even if it does not, through carelessness of preparation or administration, introduce infection where none had existed previously.

The *internal organs of generation* (Figs. 9 and 10) consist of the *uterus,* the *Fallopian tubes,* and the *ovaries.*

The *uterus,* or womb (Fig. 11), is a hollow, pear-shaped organ about three inches in length in the non-pregnant state. It is composed of muscular tissue, covered externally almost wholly with peritoneum and internally with mucous membrane, and is suspended in the pelvis by means of a number of ligaments

arranged in pairs and stretching across from the uterus to the sides of the pelvis or to other pelvic organs. This arrangement of the ligaments is such that the uterus is allowed considerable freedom of motion, and its position varies slightly with respiration, with the posture of the woman, and with the condition of the bowels and bladder. In other words, the uterus has no

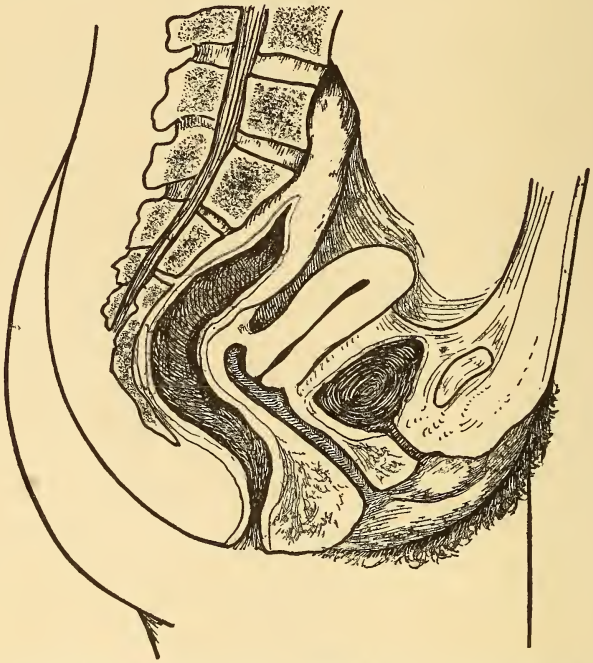


FIG. 9.—Internal organs of generation. (Keating and Coe.) Showing the uterus in its normal position between the bladder and the rectum. The vagina lies between the lower border of the bladder and the meatus urinarius above and the rectum and anus below, separated from the latter by the perineum.

intimate attachment to any fixed point, but hangs in the pelvis in a way to permit of its enormous enlargement during pregnancy,—from about the size of an egg before conception has occurred to that of a fairly large pumpkin at the time of labor. The uterus lies in about the centre of the pelvis, below the brim, with the bladder in front and the rectum behind, so that, of

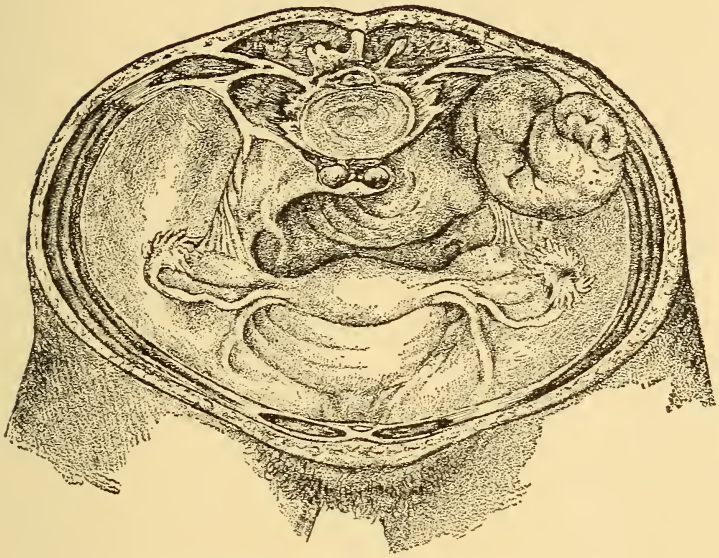


FIG. 10.—The internal organs of generation, seen from above. (Keating and Coe.)

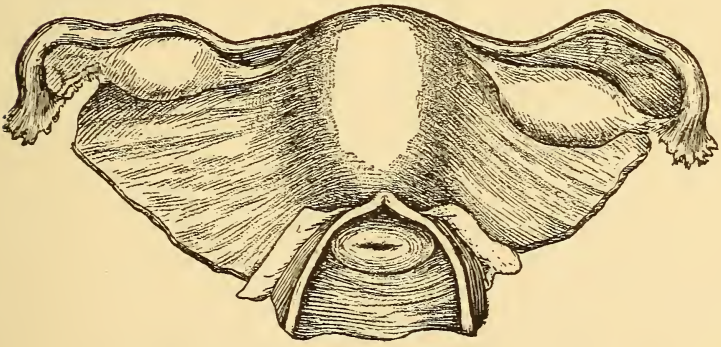


FIG. 11.—The uterus and its appendages. (Keating and Coe.) The ovaries are the almond-shaped bodies lying between the uterus and the extremities of the Fallopian tubes.

necessity, a full rectum will force it forward and a distended bladder will tilt it backward. Its upper, rounded border is called the *fundus,* and its lower, narrowed portion the *cervix,* while that part between the fundus and the cervix is termed the *body* of the uterus. The cervix projects into the vagina for a distance of about half an inch, much as a cork projects into the neck of a bottle.

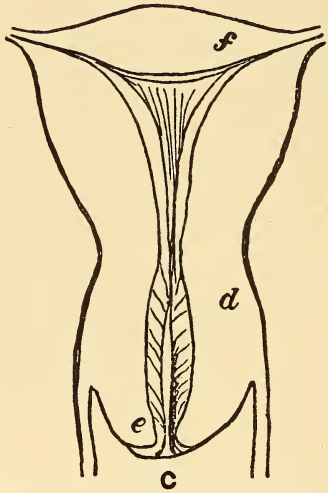


FIG. 12.—The cavity of the uterus. (Garrigues.) *c*, vagina; *e*, external os; *d*, internal os; *f*, fundus, the letter being placed over the entrance of the Fallopian tube.

The spaces between the sides of that part of the cervix which extends into the vagina and the vaginal walls are termed *fornices* (plural of *fornix*), and are divided into four parts. The *anterior fornix* is between the anterior wall of the cervix and the anterior vaginal wall; the *posterior fornix* is between the posterior vaginal wall and the posterior wall of the cervix; the *lateral fornices* are the spaces between the cervix and the vaginal walls on either side.

The *cavity of the uterus* (Fig. 12) is lined with mucous membrane, and is divided into two parts,—the *cavity of the body* and the *cavity of the cervix.* The *cavity of the body* is tri-

angular in shape, with its apex pointing downward, while that of the *cervix* is spindle-shaped.

There are *three openings* into the cavity of the uterus. The *external opening,* called the *external os* (Latin for mouth), is in the centre of the cervix as it projects into the vagina. It is very small in the non-pregnant state, barely admitting a probe, but at the time of labor it dilates to a size sufficient to permit the passage of the fœtus. The *other openings* are at the upper angles of the triangular cavity of the body and lead into the *Fallopian tubes,* which will be described later. As the Fallopian tubes open directly into the peritoneal cavity, it will be seen that there is a direct avenue from the peritoneum to the outer world, through the Fallopian tubes, the uterus, and the vagina.

The *cavity of the cervix* is slightly distended above the external os, to become contracted again at its junction with that of the body. This second contraction is termed the *internal os,* and it is because of these two points of contraction that the cavity of the cervix acquires its spindle shape.

The *Fallopian tubes* (see Fig. 11) are two trumpet-shaped tubes, from four to five inches in length, extending from the upper angles of the uterus, just below the fundus, towards the sides of the pelvis. Between their outer extremities and the uterus, on either side, are found

The *ovaries* (Fig. 13), which are the germ-producing organs of the woman and about the size and shape of an English walnut. Each ovary contains in its substance at birth a vast number of germs or *ovules* (from Latin, meaning "little eggs"), and, beginning at about the time of puberty and occurring at or about every menstrual period, one or possibly two of these ovules enlarges, approaches the surface of the ovary, escapes into the Fallopian tube, and so passes on into the uterus.

The ovule which has "matured" in this way is the only one that can be impregnated by the male germ, and if there is no male element present in the Fallopian tube, where impregnation usually occurs, nothing results beyond the usual menstrual phenomena.

The PERINEUM (see Fig. 9) can hardly be considered as

belonging to the organs of generation, but it may best be described in this chapter. Briefly, and as far as the nurse is concerned, it is the triangular mass of tissue which separates the vagina from the rectum. Its *upper surface* is covered by the

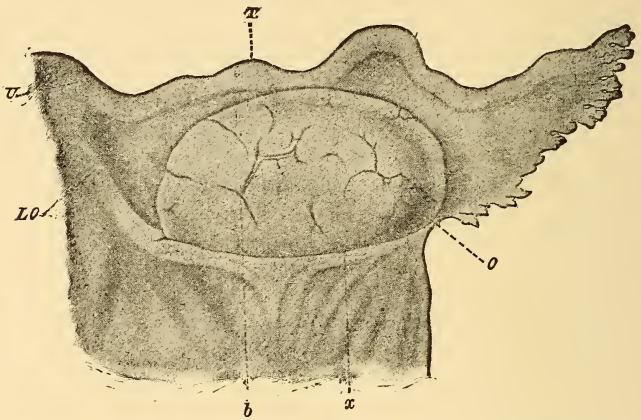


FIG. 13.—Ovary and tube of a girl twenty-four years old. (Waldeyer.) *U*, uterus, *T*, tube; *LO*, ovarian ligament; *o*, ovary; *x*, limit of peritoneum; *b*, cicatrices of ruptured Graafian follicles.

lower wall of the vagina, its *posterior surface* is in contact with the rectum, and its *external surface* is covered with skin and lies between the lower angle of the vulva and the anus. The perineum forms the floor of the genital canal, and in certain difficult labors it is torn, when the head is born, to an extent varying all the way from a slight nick in the skin to a deep laceration extending through the anus into the rectum itself.

The MAMMÆ (*mammary glands* or *breasts*) are two highly specialized sebaceous glands located on either side of the anterior wall of the chest between the third and seventh ribs. They secrete the milk which serves as the sole nourishment of the infant during the early months of its life, and they are abundantly supplied with nerves and blood-vessels and intimately connected, by means of the sympathetic system, with the uterus and other generative organs. This sympathetic relation is especially noticeable when the infant nurses immediately after birth

and reflex uterine contractions result from the irritation of the nipple caused by the suckling.

The breasts of a woman who has never borne a child are conical or hemispherical in form, but their size and shape vary greatly in women who have nursed one or more infants.

The breasts are made up of glandular tissue and fat, and each organ is divided into fifteen or twenty *lobes,* which are separated from each other by fibrous and fatty walls and subdivided into numerous *lobules* (*little lobes*) (Fig. 14). The

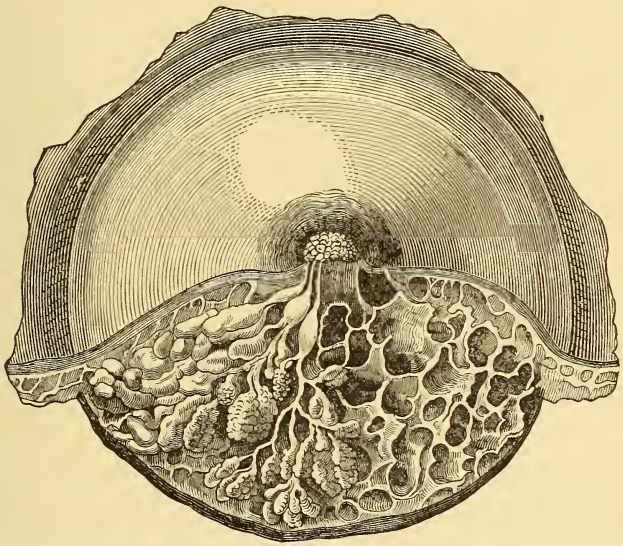


FIG. 14.—Mammary gland of a woman during lactation, with lactiferous ducts and sinuses (Luschka.)

lobules are composed of *acini* (plural of *acinus*), in which the milk is formed, and as the ducts approach the nipple they are dilated to form little reservoirs in which the milk is stored, but contract again as they pass into the nipple.

The *external surface* of the breast is divided into three portions, as follows: (*a*) The white, smooth, and soft area of *skin* extending from the circumference of the gland to the areola. (*b*) The *areola,* which surrounds the nipple and is of

a delicate pinkish hue in blondes and a darker rose-color in brunettes. Under the influence of gestation the areola becomes darker in shade, and this pigmentation which is more marked in brunettes than in blondes, constitutes, in many cases, a valuable sign of pregnancy (see Figs. 31 and 36). (*c*) The *nipple,* a large conical papilla projecting from the centre of the areola and having at its summit the openings of the milk ducts.

IV

Ovulation and Menstruation

As stated in the previous chapter, the ovaries contain in their substance, at birth, a great number (about seventy thousand) of undeveloped *ova* or "eggs," and it is unnecessary to say that these ova are microscopical in size.

Beginning, in this climate, at about the thirteenth year of age and occurring about once a month, one of these ova enlarges and approaches the surface of the ovary. This enlarged ovum, lying directly under the surface of the ovary, constitutes what is known as the *Graafian follicle* (Fig. 15), and projects slightly,

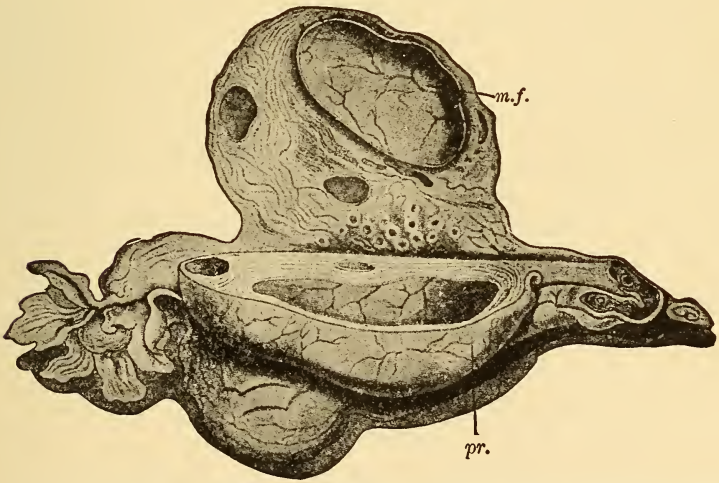


FIG. 15.—Longitudinal section through ovary of a woman twenty-two days after the last menstruation. (Leopold.) *m.f.*, mature Graafian follicle; *pr.*, most prominent point of follicle, where the rupture may be expected.

like a small pimple. The Graafian follicle then becomes thinned at one point, where it soon bursts and allows the ovum to escape into the Fallopian tube (Fig. 16).

Once within the Fallopian tube, the ovum makes its way into the uterus, and, if unimpregnated by the male element, it loses its vitality in a few days and is cast off with the menstrual flow.

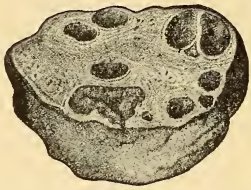


FIG. 16.—Longitudinal section of ovary of a woman on the first day of menstruation, with one burst follicle opening on the surface and other follicles in different stages of development. (Leopold.)

When, however, the male germ is present it meets and penetrates the ovum, *usually while it is still in the Fallopian tube.* The ovum thus impregnated passes on, as before, into the uterus, but instead of being cast out in the menstrual discharge it becomes adherent to the wall of the uterus and develops into the fœtus and its envelopes, the point of attachment to the uterine wall being the site of the *placenta* in later months.

It is, of course, evident that of the vast number of ova contained in the ovaries, a comparatively small number ever mature and are prepared for fertilization by the male element, and that of these, so prepared by maturation and discharge from the ovary, very few are actually impregnated; for the *impregnated* ova of any woman are accurately measured by the number of her children plus the number of her miscarriages.

This lavish provision of nature against any possible interference with the propagation of the human race is also found in the male, for, of thousands of male elements (*spermatozoa*) deposited at one time within the vagina, very few make their way through the external os and the uterus to the Fallopian tube, and, of these, but one is successful in penetrating the wall of the ovum and causing pregnancy.

This process, by which the ovum develops and is cast out from the ovary into the Fallopian tube, to be impregnated or not as the case may be, is termed *ovulation,* and while it is usually

accompanied by *menstruation,* neither process is dependent upon the other.

The accuracy of this last statement is shown by the following incontrovertible facts: *Without ovulation there can be no pregnancy,* and yet pregnancy has occurred before the establishment of menstruation; it has occurred after menstruation has ceased; and it not infrequently occurs during lactation, when menstruation is suppressed. On the other hand, menstruation may occur independently of ovulation, for it has been known to take place after the ovaries and tubes have been removed on both sides.

Menstruation is the periodical discharge of blood from the cavity of the body of the uterus, and occurs throughout the child-bearing period (from thirteen to forty-five years of age or thereabouts), at regular intervals of about twenty-eight days, except during pregnancy and lactation, when it is usually suppressed entirely. Next to twenty-eight days the most common interval is thirty days, and in certain cases the flow appears as often as every twenty-one days without any appreciable derangement of health.

The essential characteristic of normal menstruation consists in a regularity in the interval between the periods, whether it be twenty-eight, thirty, or twenty-one days. Any marked irregularity, or suppression, not due to pregnancy or lactation, indicates disease of some sort, either local or constitutional.

Excessive pain before or during the flow, accompanied by severe general symptoms, points to some disturbance of the pelvic organs, which, in turn, may be due to constitutional disease.

The duration of the flow should be from four to five days and the amount of blood lost from five to six ounces. The loss of blood is best measured by the number of napkins used, which is, commonly, an average of four daily, or twenty in all. While many women use more napkins than this, for the sake of cleanliness and personal comfort, any flow which actually *necessitates* the use of a greater number than twenty in the whole period may safely be put down as excessive.

While *regularity* in the occurrence of the flow has been men-

tioned as the chief characteristic of a normal case, it must be remembered that, at the beginning and again at the end of menstrual life, marked irregularity may persist for from one to two years.

Preceding and accompanying the discharge of blood from the uterus there are other symptoms which occur at the menstrual periods. In normal, well-developed women, not suffering from any constitutional disease, these symptoms may be no more than a feeling of weight and congestion in the pelvis, fulness and tingling of the breasts, and possibly slight headache or backache.

In another class of cases, which, unfortunately, constitutes a very large proportion of all, the symptoms accompanying the flow are far more severe. The sensation of weight and congestion in the pelvis may give way to pain of a most excruciating character, the backache may become almost unbearable, and with the intense headache may be associated nausea, or even vomiting of a distressing type.

Women who suffer to this extent are usually pale, thin, and anæmic, although they may be stout and plethoric. They commonly lead "hot-house" lives of indolence and luxury, or else they go to the opposite extreme and endure poverty and great privation. The "hot-house" type, which is the one most likely to come under the observation of the nurse, is made up largely of women whose early life has been devoid of properly regulated out-door exercise and whose later existence has been devoted to monotonous in-door pursuits, conducive to morbid introspection, or else of those whose only interest has been in the excitement of social pleasures with their accompanying late hours and exhilarating dinners and suppers.

All marked abnormalities of menstruation are of direct obstetric importance, for a patient presenting such abnormal symptoms is almost certainly suffering from the effects of a displaced or undeveloped uterus, and a deformity or slight contraction of the pelvis will be found in a fair proportion of cases.

The time of life at which menstruation is first established is called *puberty,* and, as has already been stated, it usually occurs in this climate at about the thirteenth year. In tropical countries

puberty appears at a much earlier age, often as soon as the eighth or ninth year, while in the extreme north it is commonly delayed until the seventeenth or eighteenth year.

Accompanying the appearance of the menstrual flow, which, as has been said, is apt to be irregular and scanty for the first few months, other changes in the child, peculiar to puberty, develop. She loses her girlish traits and habits and takes on the characteristics of a woman. Her manner becomes more restrained, and her liking for childish games and pastimes disappears. She prefers the society of her elders to that of her former comrades, and unless she is carefully watched and wisely counselled she is apt to grow moody and lackadaisical. At the same time her figure develops into womanly form,—her breasts fill out and her hips broaden. In short, almost before her family and friends have had time to realize that a change is going on, the child has vanished and the woman is in her place.

This transition period, from girlhood to womanhood, is one of the most critical in the life of every woman, and, especially among girls of delicate breeding, it must be surrounded by every possible safeguard if perfect physical development and future health and strength are to be secured.

Until menstruation is fully established and occurs at regular intervals, free from pain or special discomfort, the girl is to be treated much as a convalescent patient. Attendance at school is to be stopped, and if any studying at all is undertaken it should be only of simple subjects, easily mastered and possessing special interest. Exercise in the open air should be taken daily in moderate amount, and a daily bath followed by brisk rubbing, but discontinued, of course, during the time of the flow, is of prime importance. Plenty of sleep, in a well-ventilated room, is to be insisted upon, and meals should be of light but nutritious food served at proper intervals. All excitement, late hours, and theatre-going must be given up.

Whenever the flow appears, the first day is to be spent in bed, no matter how well the patient may feel, and she is to remain in bed until all pain or other discomfort is gone, even if it lasts throughout the entire period.

The bowels are to be kept in good condition, and if simple home laxatives do not produce one satisfactory movement daily the physician should be notified.

If these simple rules were observed by every young girl at the time of puberty and conscientiously followed out until the menstrual function was fully established, there would be far fewer complications during pregnancy and labor.

The amount of study and work that the average school-girl undertakes from her thirteenth to her fifteenth year can be much more easily and satisfactorily performed at a later period if she devotes that part of her life solely to her physical development. As a perfect specimen of womanhood she can, in after years, more than make up for this slight and temporary interruption of her intellectual advancement, while the advantages of an ideal physical development, lasting throughout her entire life, should of themselves be sufficient reason for the practice of every imaginable precaution at this most important time of life.

The end of menstrual life, called the *menopause*, *climacteric*, or "change of life," occurs at about the forty-third year. At this time the periods again become irregular for a few months before ceasing entirely, and women are apt to suffer from vague forebodings of an indefinite, and often absurd, character.

The symptoms associated with the menopause have no especial obstetric importance except that occasionally a patient will at this time attribute the cessation of menstruation to the occurrence of pregnancy, and it is often quite a difficult matter to convince her of her error. On this account the nurse will do well to regard with some suspicion any claim of pregnancy in a woman who has reached a suitable age for the establishment of the menopause, but, as pregnancy *may* occur at this age, she must be very careful not to express her opinion in the matter, but let a physician decide the question definitely.

V

Fetal Development

The ovum, originating in the ovary and discharged through the Graafian follicle at or about the time of menstruation, passes into the Fallopian tube, where, if pregnancy is to occur, it meets the male element or *spermatozoön.* The *spermatozoön,* shaped

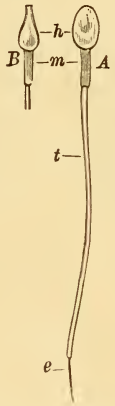


Fig. 17.—Human spermatozoa. (Retzius.) *A*, front view of a spermatozoön; *B*, side view; *h*, head; *m*, middle piece; *t*, tail; *e*, end piece.

like a tadpole, with head and long tail (Fig. 17), penetrates the wall of the egg-like ovum and conception has taken place.

The interior of the ovum, corresponding somewhat to the yolk of an egg and now containing the spermatozoön, divides into two parts, each part containing half of the yolk and half of the spermatozoön. Each of these parts divides in the same way, and each subdivision again divides and subdivides until the interior of the ovum is filled with a mass of minute divisions of the original yolk and spermatozoön (Fig. 18). These are called "cells," and keep on dividing and subdividing in the same manner to form the fœtus and its envelopes. As each separate cell

contains part of the maternal element (ovum) and part of the paternal element (spermatozoön), it is not difficult to understand why the child partakes of the characteristics of both father and mother.

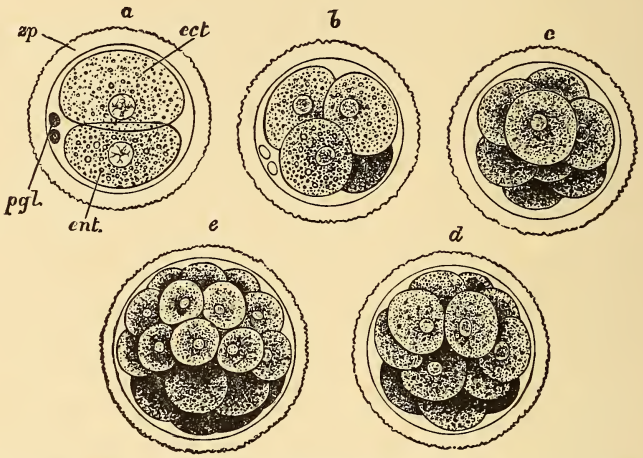


FIG. 18.—First stages of segmentation of the ovum of a rabbit. (Allen Thomson, after Edward van Beneden's description.)

During this process of subdivision of the ovum, which is called *segmentation,* the entire mass passes slowly on through the Fallopian tube until it emerges into the cavity of the uterus. Once within the cavity, it lodges in one of the folds of the mucous lining, usually in the region of the fundus, and the borders of this fold reach up around it to hold it firmly and prevent its dislodgement (Fig. 19).

The mucous membrane lining the uterus undergoes certain changes at each menstrual period, and, as it was formerly supposed to be cast off with the menstrual flow and a new membrane formed before the next period occurred, it was called *decidua* (Latin, *deciduus*, falling off). It it now understood that little or no tissue from the lining of the uterus is lost in the monthly discharge, but the old name is still retained, although the elaborate distinctions between the "decidua of menstruation" and the "decidua of pregnancy" are no longer dis-

cussed as formerly. Upon the occurrence of pregnancy there can be, of course, no "falling off" of the uterine lining, no matter what may once have been thought to have taken place at the monthly flow, or the ovum itself would be cast away at the same time and abortion or miscarriage would result.

The uterine lining contains a vast number of little creases or folds and the impregnated ovum, after passing from the Fallopian tube into the womb, lodges in one of these and becomes securely attached to the mucous membrane, usually near the upper part of the organ, as has already been said. Once securely fixed at this point, the walls of the fold in which the ovum is lodged begin to grow up around it until they meet and enclose it as in a shell. This little shell, containing the impregnated ovum, is made up of decidua, and there is other decidua lining the rest of the uterine cavity upon which this "shell" and its contents lie, much as would a wart in the palm of the hand when the hand was tightly closed.

Thus we have, in pregnancy, *three* kinds of decidua,—(*a*) that upon which the ovum rests as soon as it lodges in the fold of the mucous membrane, called *decidua serotina;* (*b*) that which folds up around the ovum to encapsulate it, called *decidua reflexa;* and (*c*) that which lines the remainder of the uterine cavity, called *decidua vera* or "true" decidua.

These terms, "decidua serotina" and "decidua reflexa," date back to the time when it was believed that the uterine lining was cast off at every menstruation, and before any very clear understanding had been reached as to the manner of the formation of the decidua of pregnancy. At the present day the expressions *decidua basilis* and *decidua capsularis*, respectively, are undoubtedly in better usage, but as they are not so generally accepted they will receive no further notice here.

As the ovum enlarges, the decidua reflexa also increases in size until, at about the fourth month when the embryo entirely fills the uterine cavity, it meets and blends with the decidua vera at every point.

On the *decidua serotina,* or point of attachment between the impregnated ovum and the uterine wall, is formed what is known

as the *placenta,* through which the fœtus receives its nourishment and oxygen from the mother and which will be described later.

The *decidua reflexa,* both before and after it has blended with the *decidua vera,* forms the outer covering of the amniotic sac,

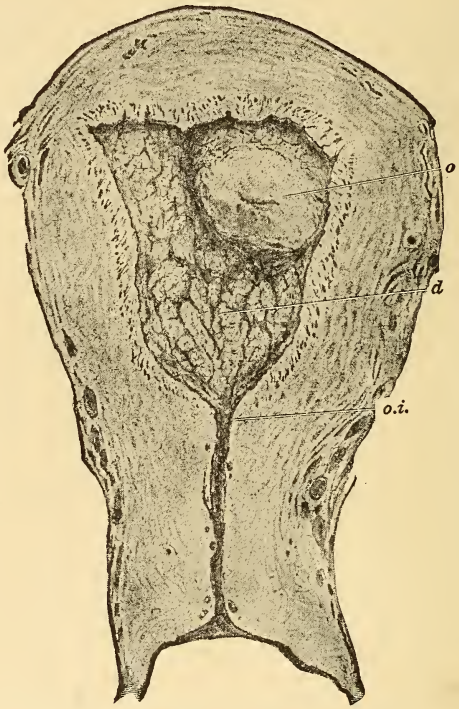


FIG. 19.—Uterus with decidua in beginning pregnancy. (Ruge.) *o.i.*, internal os; *o*, ovum, covered by decidua reflexa; *d*, decidua vera.

or "bag of membranes," which is lined with a transparent membrane called the *amnion* and filled with a pale, straw-colored liquid, the amniotic fluid or *liquor amnii,* in which the fœtus floats.

Considering, now, the fœtus at or near the time of labor, we find it floating in a straw-colored liquid, which is contained in

a sac, the "bag of membranes," or *amniotic sac,* and which lies within the uterus and fills it entirely (Fig. 20).

The *function of the amniotic* sac is to protect the fœtus from blows or other injuries that may be inflicted on the mother, while, at the same time, allowing it considerable freedom of motion; to provide it with nourishment and oxygen through the placenta; and, at the time of labor, to dilate the neck of the uterus by forcing its way down through the internal os and stretching the cervix in every direction.

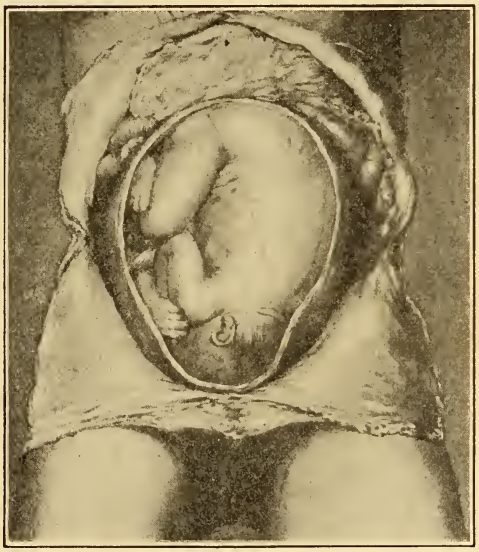


FIG. 20.—Normal position of fœtus in utero. (Garrigues.) Extremities completely flexed; occiput presenting, and back of child to left of mother and directed towards the front. (First, or left occipito-anterior, position,—"L. O. A.")

Except at one point, which corresponds to the point of attachment of the impregnated ovum to the uterine wall, the amniotic sac consists of *three layers.* The inner, called the *amnion,* which secretes the *liquor amnii,* is thin and transparent; the middle layer, called the *chorion,* is thicker and translucent; while the outer layer is made up of *decidua reflexa* and *decidua vera* fused together.

At the point of attachment of the ovum to the uterine wall, however, a different formation is found. Instead of a thin, veil-like membrane, a thick spongy mass, called the *placenta,* is developed. It, too, is covered on its inner (fetal) surface with *amnion,* under which is a layer of *chorion,* but its outer surface is composed of *decidua serotina.*

The *placenta* (Figs. 21 and 22) is a circular mass about eight inches in diameter, one to one and a half pounds in weight, and one inch in thickness at its centre, thinning out considerably towards the periphery. It forms part of the bag of membranes, and may be regarded as a large thickened area in the sac, attached firmly to the uterine wall.

It is made up almost wholly of blood-vessels, which throw out loops into the uterine tissue to interlock with somewhat similar loops in the vessels of the uterus, but there is no direct connection between the uterine and placental vessels and no actual interchange of blood. The blood of the fœtus is pumped by the fetal heart through the placental vessels, and gives up its waste products to, and takes on oxygen from, the maternal blood, much as the blood of an adult is oxygenated by passing through the lungs in vessels that lie closely in contact with the air-spaces. This process, by which waste products and oxygen can pass from fetal to maternal blood, and *vice versa,* through the walls of the vessels without any actual mingling of the blood currents, is called *osmosis.*

The placenta and fœtus are connected by means of the *funis,* or *umbilical cord,* usually about twenty inches in length and the size of the forefinger. It leaves the placenta at about its centre and enters the abdominal wall of the fœtus at a point called the *umbilicus,* or "navel," a trifle below the middle of the median line in front.

The placenta is formed during the second month of gestation, but is not fully developed until the third month, after which it steadily increases in size as pregnancy advances.

The umbilical cord is formed about the fourth week, and, like the placenta, increases in size with the advancement of pregnancy. It is made up of two arteries and one large vein,

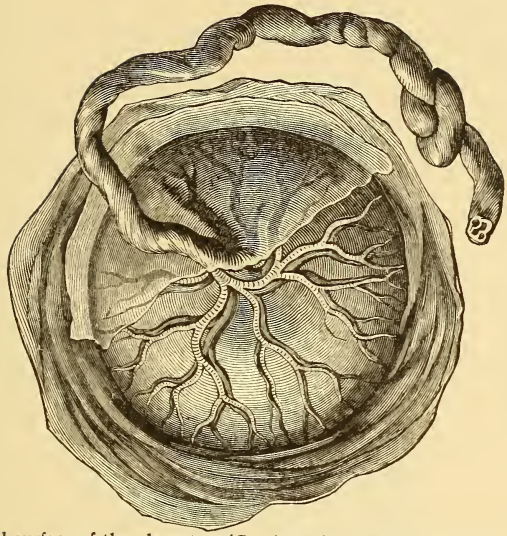


FIG. 21.—Fetal surface of the placenta. (Garrigues.) The filmy membrane about the circumference is the ruptured amniotic sac.

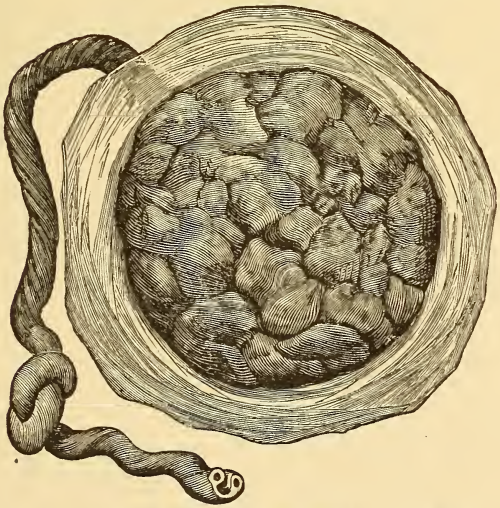


FIG. 22.—Maternal surface of the placenta. (Garrigues.)

which are twisted upon each other, and these are protected by a soft, transparent, bluish-white, gelatinous substance called "Wharton's jelly."

During the early months of pregnancy the *fœtus,* or "*embryo,*" as it is usually called, bears no resemblance whatever to the human form. *At the end of four weeks* the ovum (Fig. 23) is merely a spongy-looking sphere containing a small, curved, gelatinous mass, with no evidence of head or extremities (Fig. 24), and if an abortion occurs at this time it is almost invariably lost in the discharge of blood.

By the end of the third month it has increased considerably in size, being about four inches in length and weighing about

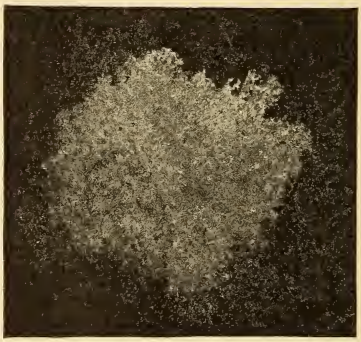


FIG. 23.—Human ovum at the end of the first month. Actual size. (Wood's Museum, Bellevue Hospital, No. 1193.)

three and one-half ounces (Fig. 25). The head is now developed, and is by far the largest part of the fœtus, being nearly one-third its entire size. The neck and extremities are also formed and the fingers are separated. The skin is of a pale rose-color and very thin and delicate. The placenta is distinctly developed, and the genital organs are formed sufficiently to permit recognition of the sex. From this time on the *embryo* is called the *fœtus.*

Development progresses rapidly as the weeks go by, and *at the end of the sixth month* marked changes have occurred. The fœtus is now about twelve inches long and weighs about

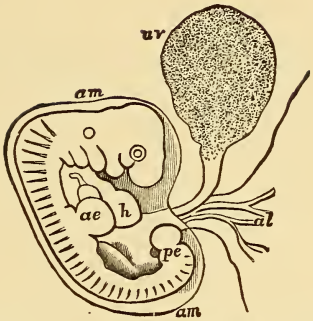


FIG. 24.—Outline of human embryo of about four weeks. Enlarged four times. (Allen Thomson.)

FIG. 25.—Human fœtus at the end of the third month. Three-fifths actual size. (Garrigues.)

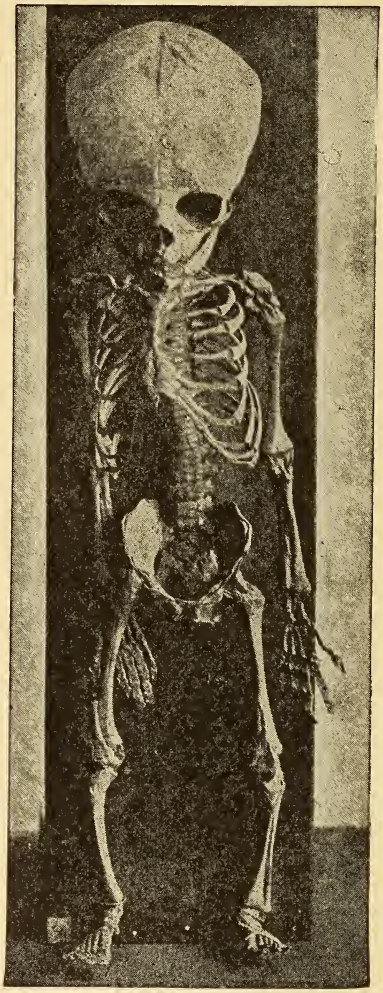


FIG. 26.—Skeleton of infant at term, showing large head, large anterior fontanelle, small thorax, cartilaginous sternum, tilted pelvis, and bow-legs. Warren Museum, Harvard University. (Rotch.)

a pound. Faint evidences of the eyelashes and eyebrows have appeared, and the skin is darker and firmer.

During the seventh month development is extremely rapid, and by the end of this period the fœtus is about fifteen inches long and weighs from three to four pounds. The eyelids can now be opened, and the skin is firmer, lighter in color than before, and covered with a greasy, sebaceous deposit, called *"vernix caseosa,"* which is most abundant in the folds of the integument, and especially in the axillæ and groin. This is probably the earliest time at which a child can be born with any reasonable prospect of living.

During the eighth month development is slower, and *by the end of the ninth,* or at "full term," the infant is plump, completely formed, and ready to perform the functions of respiration, digestion, and excretion. It is from eighteen to twenty-two inches in length and weighs from six and one-half to seven and one-half pounds. The nails are fully developed and reach the ends of the finger-tips, the hair is long and full, and the skin is firm and paler than at any other previous time.

The head of the fully developed fœtus (Fig. 26) is still the largest part of its body, although it has been growing proportionately smaller throughout the entire period of gestation. It is oval, or egg-shaped, and it is divided into two parts, *the cranium* and *the face.*

The cranium (Fig. 27) is the portion possessing the greatest obstetric importance, because, if it can pass safely through the pelvic canal, there is seldom, if ever, any difficulty in delivering the rest of the body. It is made up of *eight bones,* joined together firmly at the base but separated at the vertex, or top of the head. The *sphenoid, ethmoid,* and *two temporal* bones lie at the base of the cranium, and are of no interest to the obstetric nurse.

The *frontal, occipital,* and two *parietal* bones are, however, of great importance, and form the upper part of the cranium, separated at the time of birth by membranous intervals called *sutures,* the intersections of which are termed *fontanelles.*

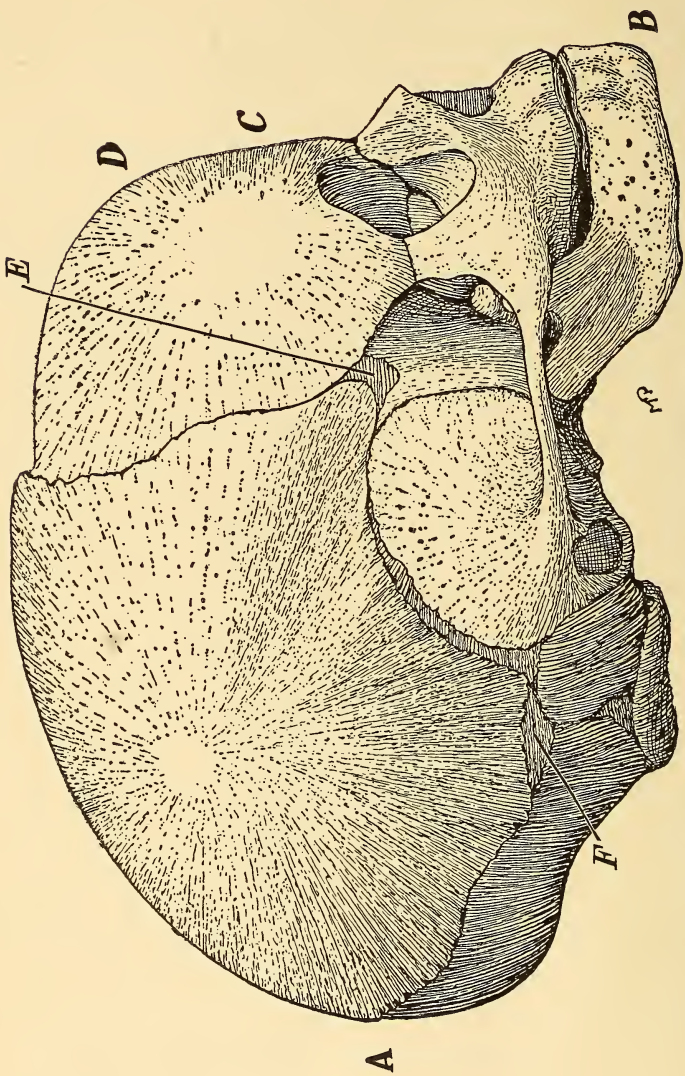


FIG. 27.—Fetal skull, side view. (Garrigues.) Actual size. The coronal suture extends from the top of the head downward on either side to the point *E*; the lambdoidal suture from the back forward, on either side, to the point *F*. The sagittal suture is not shown, but is indicated by the upper margin of the illustration, beginning at the base of the nose, passing backward across the coronal suture (anterior fontanelle), and ending at the lambdoidal suture (posterior fontanelle).

By means of this formation of the fetal skull the bones can overlap each other somewhat during labor and so diminish materially the size of the head during its passage through the pelvis. This process of overlapping is called "*moulding,*" and, after a long labor with a large child and a snug pelvis, the head is often so well moulded that several days elapse before it returns to its normal shape.

The *sutures* of the cranium are five in all, but those separating the parietal and temporal bones on either side are unimportant, as they cannot be reached by the examining finger during labor.

The *coronal* suture separates the frontal from the two parietal bones, the *lambdoidal* suture separates the occipital from the parietal bones, and the *sagittal,* or "greater suture" begins at the base of the nose, divides the frontal bone into two parts, crosses the coronal suture, separates the parietal bones from each other, and ends at the lambdoidal suture behind.

The *anterior fontanelle,* large and diamond-shaped, is at the intersection of the sagittal and coronal sutures, while at the junction of the sagittal with the lambdoidal suture is the small, triangular, *posterior fontanelle.*

The sutures and the posterior fontanelle ossify shortly after birth, but the anterior fontanelle remains open until the child is over a year old, constituting the familiar "soft spot" just above the forehead of an infant.

By feeling one or another of the sutures or fontanelles, and considering its relative position in the pelvis, the physician is enabled to determine accurately the position of the head at the beginning of labor.

The fœtus lies in the uterus in a state of complete flexion. Its body is arched forward, its head is bent upon the chest, its arms lie close to its body, with the forearms flexed and crossed in front. The thighs are flexed upon the body and the legs upon the thighs, while the feet are crossed like the hands. In nearly all cases the head points downward and the breech lies at the fundus. This is probably because the head, being the heaviest part of the fœtus, would naturally sink to the lowest part of the uterus.

The fœtus receives its nourishment and oxygen from the mother's blood into its own through the medium of the placenta. The fetal heart pumps blood through the umbilical cord into the placental vessels, which, looping in and out of the uterine tissue and lying in close contact with the uterine vessels, permit an interchange, through their walls, of waste products from child to mother and of nourishment and oxygen from mother to child. As has been said, this interchange is effected by the process of osmosis, and there is no mingling of the two blood-currents. In other words, no maternal blood actually goes to the fœtus, nor does any fetal blood reach the mother.

The fetal circulation is so arranged that this passage of blood to the placenta through the umbilical arteries and back through the umbilical vein is possible up to the time of birth, but ceases entirely the moment the child breathes and so begins to take its oxygen directly from its own lungs.

In order to understand, even in a general way, the course of the fetal blood-current, it must be borne in mind that, in the infant after birth, as in the adult, the venous blood passes from the two venæ cavæ into the right auricle of the heart, thence to the right ventricle, and through the pulmonary artery to the lungs, where it gives up its waste products and takes on a fresh supply of oxygen. After oxygenation the so-called arterial blood flows from the lungs, through the pulmonary vein to the left auricle, thence to the left ventricle, and out through the aorta, to be distributed to all parts of the body and eventually collected, as venous blood, in the two venæ cavæ and discharged again into the right auricle (Fig. 28).

In the fœtus there are certain structures necessary to the performance of fetal circulation, but of no use after respiration has commenced and the flow of blood through the umbilical and placental vessels has ceased. Consequently these structures are abandoned as soon as the child cries, and shortly after birth they either disappear entirely or are converted into fibrous cords, and remain in after life as fetal structures only.

The most important of these, and the one that must close promptly and effectually at birth if the child is to live for any

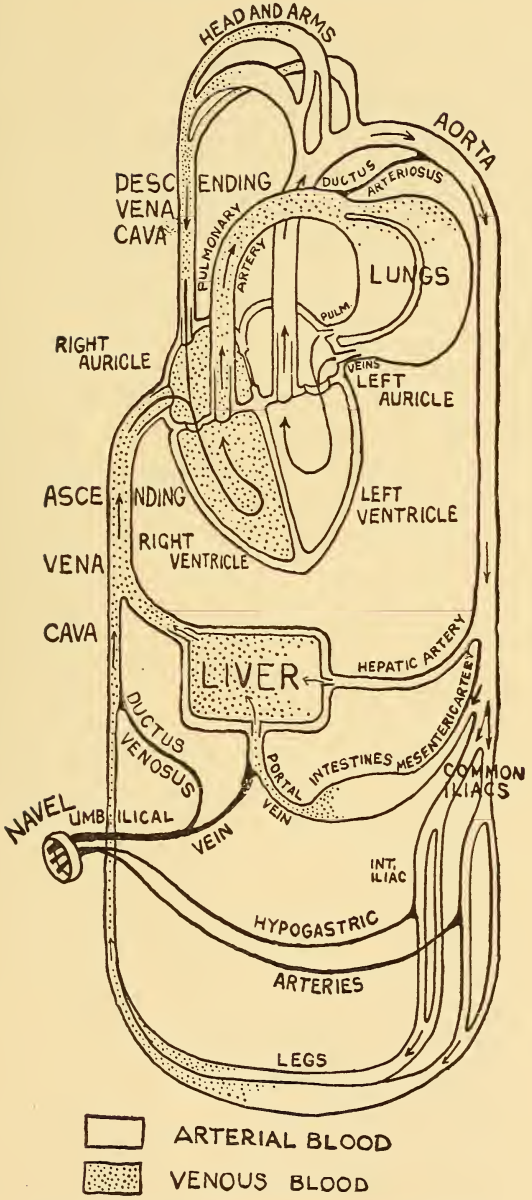


FIG. 28.—Diagram of circulation after birth. Adult type.

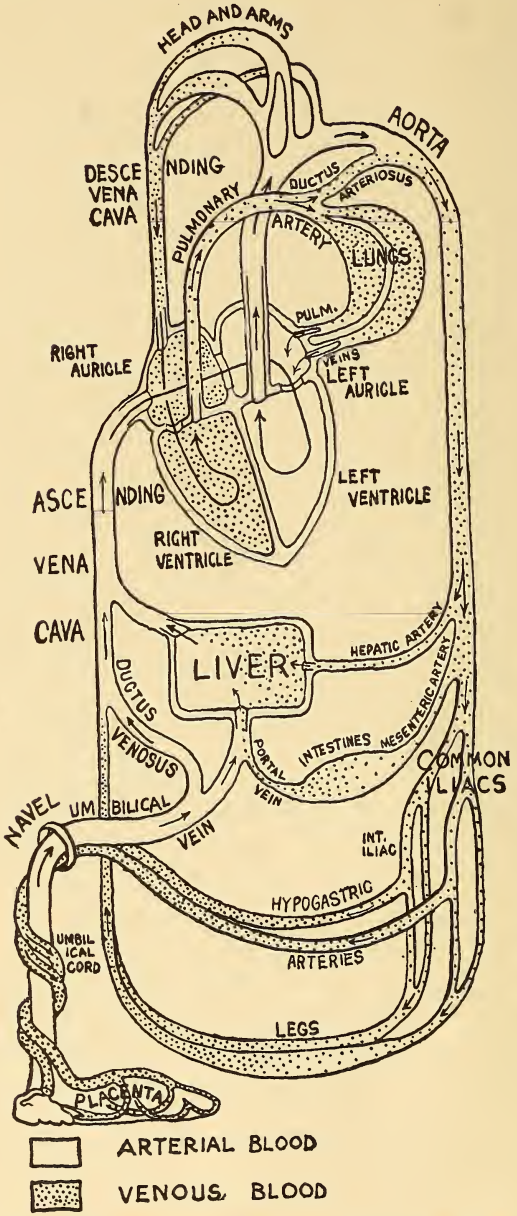


FIG. 29.—Diagram of circulation before birth. Fetal type.

length of time, is the *foramen ovale,*—a valve-like opening between the right and left auricles. The others are the *ductus arteriosus,* connecting the aorta and the pulmonary artery; the *ductus venosus,* connecting the umbilical vein and the ascending vena cava; and the two *hypogastric arteries,* springing from the internal iliacs and passing out of the abdomen, through the navel, into the cord, where they become the umbilical arteries.

Keeping in mind the course of the blood-current after birth, when these fetal structures have ceased to exist as blood-passages, we can trace the fetal circulation from the placenta, where it is oxygenated before birth, back to its starting-point (Fig. 29).

The arterial (oxygenated) blood flows up the cord through the umbilical vein and passes into the ascending vena cava, partly through the liver but chiefly through the ductus venosus which connects these two vessels. It is because of the fact that the liver receives a considerable supply of freshly vitalized blood direct from the umbilical vein that it is, proportionately, so large in the newly born child.

From the ascending vena cava the current flows into the right auricle and directly on to the left auricle through the foramen ovale, thence into the left ventricle, and out through the aorta. The blood which goes up to the arms and head returns through the descending vena cava to the right auricle again, but instead of passing through the foramen ovale as before, the current is deflected downward into the right ventricle and out through the pulmonary artery, partly to the lungs (for purposes of nutrition only), and partly again into the aorta through the ductus arteriosus.

The blood in the aorta, with the exception of that which goes to the head and upper extremities, and which has already been accounted for, passes downward to supply the trunk and lower limbs. The greater part of this blood finds its way through the internal iliacs to the hypogastric arteries, and so back through the cord to the placenta, where it is again vitalized; but a small amount passes back into the ascending vena cava, partly through the liver and partly from the lower extremities, to mingle with fresh blood from the umbilical vein and again make the circuit of the entire body.

As soon as the child is born it cries and inflates its lungs. This causes the ductus arteriosus to contract, and blood no longer passes from the pulmonary artery into the aorta. At the same time the foramen ovale closes and the blood from the venæ cavæ, which is discharged into the right auricle, passes at once into the right ventricle, to be sent through the pulmonary artery to the lungs for oxygenation.

When the cord is tied and cut the current of blood through the umbilical vessels (arteries and vein) ceases and the blood is dammed back through the hypogastric arteries to the internal iliacs and shut off completely in the umbilical vein and ductus venosus.

These processes, which occur instantaneously, change the entire course of the blood-current and convert the fetal circulation into the ordinary adult type. The foramen ovale remains closed and eventually disappears, and the ductus arteriosus, ductus venosus, and hypogastric arteries shrivel up and are converted into fibrous cords in the course of ten or fifteen days.

When, as occasionally happens, two or more embryos develop in the uterus at the same time the condition is known as *multiple gestation.*

This is of very rare occurrence, twins being encountered but once in 90 pregnancies, triplets but once in 8000, and quadruplets but once in 370,000. These figures, of course, vary considerably, but they serve to show the extreme rarity of multiple conceptions.

In twin pregnancies the most common combination of sex is a boy and a girl; the next in frequency is two boys; and the least common of all is two girls.

Heredity plays an important part in the causation of twins, often making certain families conspicuous on this account, and the hereditary trait is most frequently handed down through the father.

Twins are usually due to the fertilization of two separate ova, either from the same or from different Graafian follicles, but they may result from the double impregnation of a single ovum by two spermatozoa or from the complete fusion of a single germ.

Triplets come from the double impregnation or complete fusion of one ovum and the simultaneous single fertilization of another, while quadruplets may be regarded as double twins.

In the case of twins it is to be borne in mind that as both umbilical cords may come from the same placenta, the maternal end of the cord attached to the first-born must be tied securely before it is cut, lest the unborn child bleed to death. The nurse, from whom skill in ante-partum diagnosis is not to be expected, should make it a point to tie securely both the fetal and the maternal end of every cord before cutting, in view of the possibility of the existence of twins.

The development of the fœtus in multiple pregnancies does not differ from that of single impregnation, except that the infants are apt to be small and feeble, usually one being decidedly weaker and punier than the other.

VI

The Physiology of Pregnancy

By the PHYSIOLOGY OF PREGNANCY is meant a consideration of those changes, both local and general, which affect the maternal organism as a result of pregnancy, but which subside at or before the end of the puerperium and leave the woman in practically the same condition in which she was before conception occurred. In other words, these changes are to be regarded as normal, unavoidable, and purely temporary, for they are present in varying degree in every instance, and in the case of a physically perfect woman there should be no traces of them left after convalescence is complete. It must be understood that this statement does not refer to certain skin-markings, which will be described later, nor to the slight and unimportant lacerations of the genital tract which invariably accompany a first labor, but only to such conditions as would have a tendency to affect the general health or even the comfort of the woman.

Among patients of the class most likely to secure the services of a graduate nurse at the time of their lying-in the baneful effects of modern life and dress have often so undermined their constitutions that even these theoretically normal results of utero-gestation and labor may leave permanent defects and weaknesses in the maternal organism. Hence it is important for the nurse to know what changes are physiological and to be expected, in order that she may be quick to observe any condition that even borders on the pathological.

The *uterus,* of course, increases in size to make room for the growing fœtus, and the *abdomen* must also enlarge to accommodate the uterus.

This distention of the abdominal wall causes, in the later months of pregnancy, the formation of certain reddish or bluish streaks in the skin covering the sides of the belly and the anterior and outer aspects of the thighs. These streaks are known as "*striæ gravidarum,*" or "*lineæ albicantes,*" and are due to the

FIG. 30.—Striæ gravidarum, or Lineæ albicantes, showing also abdominal pigmentation especially marked around navel, and protrusion of umbilicus. Multigravida at term. Twins.

stretching, rupture, and atrophy of the deep connective tissue of the skin (Fig. 30). They grow lighter in color after labor has taken place, and finally take on the silvery whiteness of cicatricial tissue. In subsequent pregnancies *new* reddish or bluish lines may be found mingled with *old* silvery white striæ.

The number, size, and distribution of *striæ gravidarum* vary exceedingly in different women, and patients are occasionally seen in whom there are no such markings whatever, even after repeated pregnancies.

As the striæ are due solely to the stretching of the cutis, they are not peculiar to pregnancy, but may be found in other conditions which cause great abdominal distention, such as dropsy and the presence of large tumors of rapid growth.

Coincident with the uterine and abdominal enlargement the *umbilicus* is pushed upward until, at about the seventh month, its depression is completely obliterated and it forms merely a darkened area in the smooth and tense abdominal wall. Later it is raised above the surrounding integument and projects to about the size of a hickory-nut.

While these changes in the uterus and abdomen are going on the *vagina* and *external genital organs* are being prepared for the passage of the fœtus at the time of labor. The parts are thickened and softened and their vascularity is greatly increased. This increase in the blood-supply of the genital canal gives to the tissues a dark-violet hue, in great contrast to the ordinary pinkish color of the parts, and often described as a valuable sign of pregnancy.

Towards the end of gestation the *vaginal secretion* is increased in amount to serve as a lubricant at the time of delivery.

The changes in the *breasts* are such as will prepare these organs for the performance of nursing, and begin to show themselves shortly after the occurrence of conception (Fig. 31). The breasts become larger, firmer, and more prominent, and the nipples increase in size, grow sensitive, and are easily stimulated to erectility. The pinkish areola about the nipple of the woman who has never borne a child grows larger and darker until it becomes brown or, in some cases, almost black. This change

in the color of the tissue surrounding the nipple is most pronounced in decided brunettes and less marked in women of the blonde type. The sebaceous glands which surround the nipple to the number of about a dozen, and are known as the "glands of Montgomery," become enlarged into little rounded elevations under the influence of pregnancy, and are then called the "*tubercles* of Montgomery" (see Fig. 36).

The distention of the skin covering the breasts also causes the formation of "striæ" similar in every respect to those already described as occurring in the abdominal integument. Like the abdominal striæ, these markings vary greatly in different subjects and not infrequently are entirely absent.

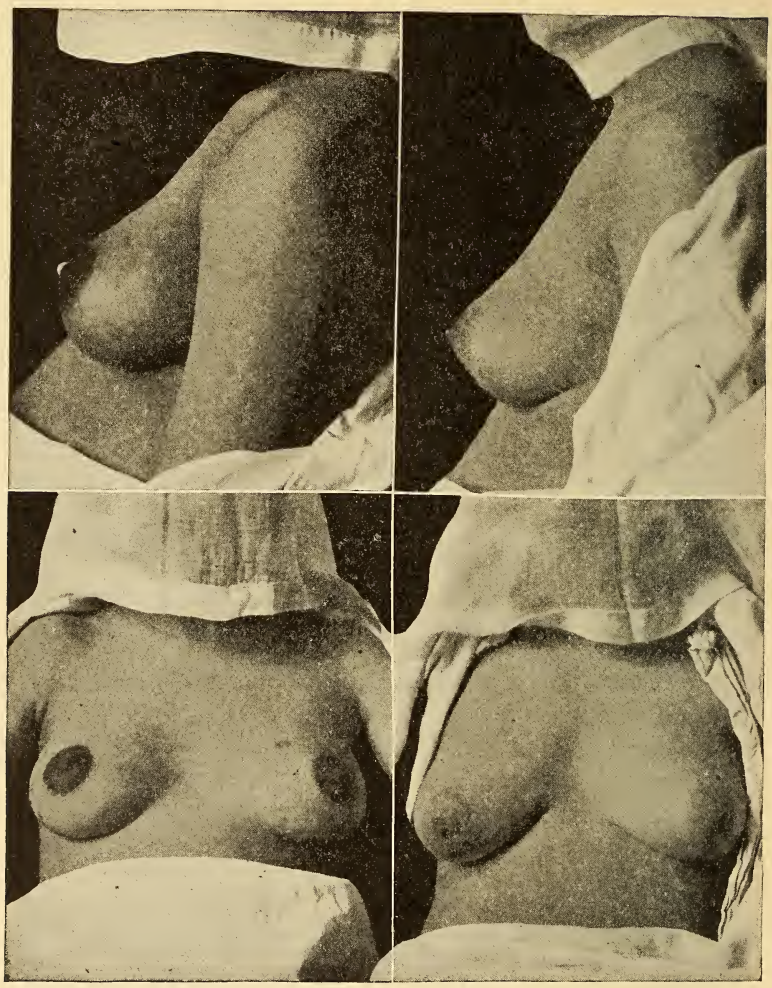
After the third month the breasts contain a thin, bluish-white, translucent fluid known as "*colostrum,*" consisting chiefly of fat corpuscles, epithelial cells, and "colostrum corpuscles." Colostrum is the only substance secreted by the breast until about the third day after labor, when the true milk is formed. It contains practically no nourishment, but is of value to the infant during the early days of its life because of its marked laxative effect.

The *blood* of the pregnant woman is increased in amount and in its watery constituents, while its red cells are proportionately diminished. These changes frequently cause disturbances of the circulatory apparatus, and the left side of the heart is appreciably enlarged in order to perform the extra work of pumping this increased quantity of blood through the body.

Palpitation of the heart is not uncommon, and is due, in the early months of pregnancy, to sympathetic nervous disturbance, and towards the end of gestation to the pressure of the enlarged uterus.

In certain cases the watery constituents of the blood are increased to such a degree that marked swelling (œdema) of the legs, thighs, and external genitals may occur. This œdema must not be confused with that due to kidney disorder, and any swelling of the extremities should be reported at once to the physician.

The *lungs* are subjected, in the later months of pregnancy,



A B

FIG. 31.—The breasts of pregnancy. A, A, in a brunette; B, B, in a blonde. At or near full term.

to pressure from the underlying uterus, and the patient may suffer severely from cough and dyspnœa. Owing to the increase in the total quantity of maternal blood, and because of the fact that the mother is called upon to oxygenate not only her own blood but, by osmosis, that of her infant as well, the work of the lungs is markedly increased and the elimination of carbonic acid gas is much greater than in the non-pregnant state.

The *digestive, secretive,* and *excretive* organs are likewise taxed to a high degree, for the pregnant woman must, in order to nourish both her child and herself, form more blood, digest more food, and excrete more waste products. After a few weeks these increased demands on the digestive organs begin to manifest themselves by causing nausea and vomiting, and the patient is fortunate if these symptoms do not cause her great distress up to about the middle of gestation.

The *appetite* also is apt to be capricious in the early months, and, owing to the nausea, it may be greatly diminished.

As pregnancy advances and the digestive apparatus seems to become accustomed to its new conditions, these disagreeable features gradually disappear and the patient usually eats heartily and gains in weight and strength. Her increase in flesh is often noticeable, and the deposits of fat are most marked about the breasts, abdomen, and hips, giving a rounded fulness to her figure.

The *body temperature* probably undergoes no change during pregnancy, although it is said by some writers to rise a fraction of a degree towards night. This point is not firmly established, and any regular, though slight, evening exacerbation of temperature should be reported to the attending physician.

The *skin* is affected by an increased activity of the sebaceous and sweat-glands and the hair follicles. A marked improvement in the growth of the hair is often noticeable at this time, and many women whose hair was thin and brittle before the occurrence of conception find it long and luxuriant at the end of the puerperium. The increased activity of the sweat-glands is due to their efforts to assist the kidneys in the elimination of waste material.

In addition, there are also deposits of pigment in various parts of the integument, most noticeable about the nipples and umbilicus and along the median line of the abdomen from the mons veneris to the navel (Fig. 32). In certain cases, also,

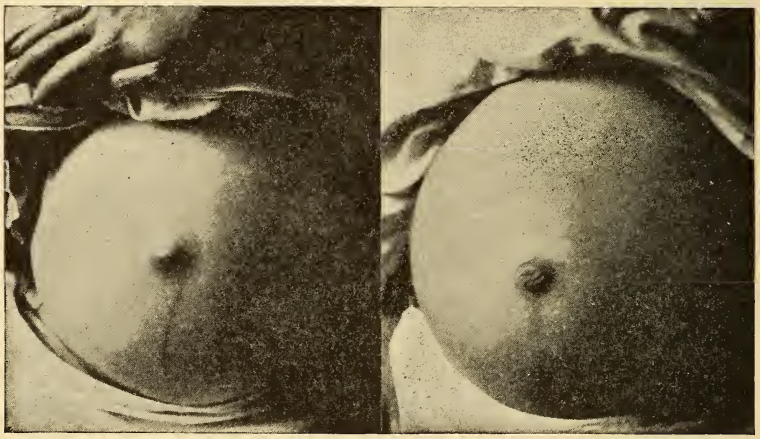


FIG. 32.—Abdominal pigmentation. Deposits of pigment in median line and protrusion of umbilicus clearly shown. Primigravidæ at about the eighth month.

irregular spots or blotches of a muddy brown color, resembling large freckles of varying size and shape, appear on the face, and dark rings are formed under the eyes. These facial deposits, which in rare instances may be distributed over the entire body, are known as "*chloasmata*" (plural of *chloasma*), and often cause the patient great mental distress, but her mind can be relieved by the assurance that they will disappear after labor, if not before. The pigmentation of the breasts and abdomen, however, never disappears entirely, though it is usually much less pronounced after the birth of the child.

All of these pigmentary deposits vary exceedingly in size, shape, and distribution, and are usually more marked in brunettes than in blondes. The abdominal and, especially, the mammary markings are present in almost every case, but the facial deposits are of comparatively rare occurrence, especially in their exaggerated forms.

The *pelvis* shows certain changes due to pregnancy, which are manifested by a thickening and softening of the cartilages lining the joints. This, combined with a tipping backward of the spinal column and a throwing back of the head and shoulders, necessary to enable the woman to maintain her balance in the erect posture, gives to the patient a peculiar "wobbly" gait, quite characteristic of pregnancy and especially noticeable in short women.

The *urine* of pregnancy is decidedly increased in amount, and is usually of a pale straw-color and low specific gravity. Owing to the pressure on the bladder from the enlarged uterus, and also because of the increase in the total quantity of urine to be voided in each twenty-four hours, the act of urination is usually very frequent and occasionally most uncomfortably so. Traces of albumin are to be found at one time or another in the urine of practically every pregnant woman, and while, in the majority of cases, this albuminuria is purely physiological and transitory, it may be of a progressive type and indicate renal disturbance of a serious nature. In like manner, glucose (sugar) is to be found at times in the urine of pregnancy, and, while its presence may be of no especial significance, it should be carefully watched.

Hence regular and more or less frequent examinations of the urine are necessary throughout the entire period of gestation, and it is part of the nurse's duty to her patient to see that specimens are secured at proper intervals and sent to the attending physician for analysis.

In cases where there is a history of previous kidney disease, or with patients who have suffered from scarlet fever or diphtheria, the importance of regular urinary examinations at frequent intervals cannot be too strongly emphasized, for, at any time under the influence of pregnancy, a latent nephritis may light up and assume most dangerous proportions.

The effect of pregnancy on the *nervous system* varies greatly, and, while some women may entirely escape such manifestations, the majority of patients present more or less altered mental and emotional characteristics, varying all the way from fretfulness and peevishness to actual insanity of a melancholic or even

maniacal type. In rare instances the change is quite to the opposite extreme, and a woman who is ordinarily of an irritable disposition becomes exceedingly amiable and agreeable.

The most evenly balanced woman is subject to these emotional changes, and it is impossible to foretell how pregnancy will affect any given patient, but in general it may be said that the psychical factor enters largely into the question, and that the more strongly the woman desires a child the more apt will she be to go through her pregnancy without disagreeable nervous manifestations.

Moreover, the higher the patient stands in the social scale the more likely is her nervous system to break down under the strain of pregnancy, and the nurse who may never have witnessed any such complications during her hospital training will encounter many such women in the private practice of her profession.

It is to be borne in mind that none of the conditions described in this chapter is such as should cause special discomfort to a healthy woman whose pregnancy is proceeding in a natural manner, and any symptom that becomes unduly prominent should be reported to the physician at once.

VII

The Disorders of Pregnancy

THE DISORDERS OF PREGNANCY are, in many instances, merely exaggerated states of those conditions already described as being, in their milder forms, purely physiological and unavoidable. On the other hand, symptoms appear at times which must be regarded from the very moment of their onset as unnatural and pathological. The properly trained nurse should be able to distinguish accurately between conditions which are mere exaggerations of true physiological phenomena and those which are entirely pathological and inherently dangerous to the life or health of the patient.

NAUSEA AND VOMITING, if occurring only in the morning and subsiding by about noon, so that during the latter part of the day the patient is able to enjoy and retain her food, are to be considered as physiological conditions, of importance only as they cause discomfort to the woman. This is the usual type of the "morning sickness" of pregnancy, and the patient is always able to assimilate enough nourishment each afternoon and evening to suffice for the entire day. In normal cases these symptoms should disappear entirely by about the middle of the fourth month, and they call for no medicinal treatment beyond the occasional administration of laxatives to keep the bowels in good condition. The nurse can, however, do much to make the patient comfortable and lessen the annoyance of morning sickness by giving a glass of hot milk or a cup of tea or coffee with toast or biscuits half an hour before the patient arises. This should be taken in the recumbent position, and the woman should lie still on her back for a full half-hour afterwards. When she attempts to arise she should do so slowly and gradually, avoiding any sudden change to the upright posture. The morning vomiting almost never begins until the patient gets out of bed on her feet, and if the stomach can be induced

to retain even a small quantity of food in the early morning it will usually continue to do so for the rest of the day. This simple procedure, coupled with careful attention to the condition of the bowels, often affords great relief, and should always be given a fair trial.

In cases which prove more troublesome, without actually becoming serious, the writer frequently prescribes ten grains of sodium bromide dissolved in one tablespoonful of camphor water and given every three or four hours. This remedy is perfectly harmless in the proportions named, and while, as a rule, it is not wise for the nurse to order drugs on her own responsibility, there can be no objection to her availing herself of it in certain cases, as, for example, when she is travelling with a patient and no physician is obtainable.

When, however, the vomiting persists throughout the entire day and into the night, so that the patient is not only unable to retain any nourishment whatever, but loses her sleep as well, the condition is wholly different and becomes distinctly pathological. Such women lose flesh and strength and quickly become emaciated to a startling degree. As the condition advances they develop fever, the so-called "starvation temperature," and unless relief is afforded promptly they lapse into the typhoid state and die of exhaustion. This is, of course, an extreme type, and one that will rarely be encountered, but the passage from the harmless form of vomiting to the variety that may properly be termed *pernicious* is very insidious, and the nurse must constantly be on the alert lest her patient retain too little nourishment and so begin to lose flesh and strength.

As a safe rule of guidance, the nurse should regard with suspicion any vomiting that persists beyond the noon hour, and report the fact to the physician.

The *treatment of the more severe forms* of morning sickness lies, of course, with the medical attendant, but the nurse must never forget that the whole affair is of nervous origin and that it is extremely detrimental for her to express before the patient the slightest evidence of apprehension as to the prospect of its ultimate control. So strongly does this psychical factor enter

into the causation of the vomiting of pregnancy, of whatever type, that it is not unusual for the mere entrance into the patient's room of an eminent consulting physician to bring about an immediate cessation of the symptoms.

In severe cases all feeding by mouth is usually stopped and rectal medication and alimentation substituted. For drugs, nerve sedatives of the bromide class are usually ordered, and nutrient enemata should consist of peptonized milk, egg-nog, liquid peptonoids, panopepton, or matzoon.

Before the administration of a nutrient enema the rectum should be thoroughly washed out with a hot normal salt solution. This not only cleanses the canal and favors absorption, but the salt solution itself is taken up in considerable quantity, supplying fluid to the tissues and relieving the distressing thirst from which the patient always suffers. Not more than eight ounces of nourishment should be used at each feeding, and it should be at the body temperature and injected very slowly and as high up in the canal as possible, preferably in the colon itself. As a rule, the rectal feeding should not be given oftener than twice daily, and once in every six hours is the extreme limit.

Exclusive rectal alimentation can never be continued with safety for more than two weeks, and if by that time the vomiting has not been controlled to such a degree that the stomach will retain at least part of the required nourishment, the physician is justified in adopting more radical measures, which usually consist in the prompt termination of the pregnancy.

There is, unfortunately, a class of women who understand full well that the last resort in the treatment of the pernicious vomiting of pregnancy is the induction of abortion, and who, in their anxiety to avoid having children, deliberately keep up and aggravate their symptoms by the surreptitious self-administration of emetics. Happily, such women are not often encountered, but the nurse as well as the physican must always be on guard against the successful practice of such criminal imposition.

Many other methods of treatment have, of course, been ap-

plied from time to time for the control of the vomiting of pregnancy, and even such a simple procedure as elevating the patient's buttocks to a level above that of her head has been known to succeed, but in general any marked vomiting should be reported promptly to the physician and the treatment left in his hands.

Almost every drug in the Pharmacopœia has been suggested at one time or another as a specific in this condition, but the fact remains that no definite plan of action can be outlined to fit all cases, and treatment that proves almost miraculously successful in one instance will, and often does, fail utterly in another. With the general health, and especially the bowels, in good condition, the next most important factor in treatment is to gain the entire confidence of the patient and imbue her mind with the idea that the condition is only temporary, and that it will surely be controlled in due course of time. Above all else, the subject of vomiting must never be discussed, or even mentioned in the presence of the patient, for the mildest and most well-intentioned inquiries of relatives at the breakfast table will not infrequently precipitate a severe attack of vomiting that might otherwise have been avoided altogether. In like manner the patient should never be asked what she would like to eat, or if she feels inclined to partake of food, and the nurse must use her wits and ingenuity to learn the caprices of her patient's appetite, so that she can, without comment of any sort, place before her at proper intervals daintily prepared and tempting dishes.

It is to be distinctly understood that *any* vomiting persisting after the fifth month may be of serious import, and that this statement applies especially to that which makes its initial appearance in the latter half of pregnancy after the ordinary "morning sickness" of the early months has ceased. Any such late return of vomiting, however slight, should be reported at once to the medical attendant, for it is usually due to some form of general constitutional poisoning, known as "toxæmia," and is often the forerunner of eclampsia.

Constipation is the usual condition of the bowels during

pregnancy, and is due largely to impaired peristaltic motion of the intestine caused by pressure from the gravid uterus. The nurse should see that at least one satisfactory movement occurs daily, and, as a routine, it is well to have the patient drink a glass of hot water for this purpose each morning before breakfast. The water should be as hot as can be borne, and a pinch of salt may be added to give it a taste.

This simple treatment, combined with a largely farinaceous diet, is occasionally all that is necessary, but usually some simple laxative is required in addition. The best preparation in such cases is the *fluid extract of cascara sagrada,* given at bedtime in doses of one-half to one teaspoonful. If the bitter taste of the plain fluid extract is objectionable to the patient, the *aromatic extract* may be given instead, but it will be necessary to administer the latter preparation in about double the dosage. Starting with half a teaspoonful of the fluid extract (or one teaspoonful of the aromatic extract), either pure or in water as the patient prefers, the dose may be increased or diminished from night to night until the amount necessary to secure one daily evacuation is ascertained.

In addition to this nightly medication, an occasional glass of Hunyadi water or of one of the Saratoga waters (Hathorn or Congress) may be given before breakfast, and at times a glycerin suppository or a soapsuds enema will be indicated.

Under no circumstances should the patient be overdosed with cathartics, and the physician should be consulted if the constipation does not yield readily to some such simple plan of treatment as the one outlined above.

Diarrhœa occasionally occurs during pregnancy, and its onset should be reported at once to the medical attendant, for if it is allowed to persist it may result in a miscarriage, either because of severe straining efforts at stool or on account of an extension of the existing intestinal inflammation.

Castor oil, so commonly given at the onset of a simple diarrhœa, *cannot be allowed during pregnancy* except by direct order of the physician, for it is to be remembered that the abortifacient properties of this drug are so well marked that

they have earned for it the unenviable name of "the poor woman's ergot."

Dyspnœa (difficult breathing) occasionally results from pressure on the diaphragm of the pregnant uterus, and may be sufficient, in the last weeks, to interfere considerably with the patient's sleep and general comfort. It is not a serious condition, but, unfortunately, it cannot be wholly relieved until after the birth of the child, when it will disappear spontaneously. It is most troublesome when the patient attempts to lie down, and her comfort may be greatly enhanced by propping her well up in bed with pillows and cushions. In this semi-sitting posture she will at least sleep better and longer than with her head low.

Varicose veins may occur in the lower extremities (Fig. 33), and at times extend up as high as the external genitals or even into the pelvis itself. A varicosity is an enlargement in the calibre of a vein due to a thinning and stretching of its walls, and may be compared roughly to the bulb in the middle of a Davidson syringe. These distended areas occur at short intervals along the course of the vessel, and give it a knotted appearance. They are caused by pressure in the pelvis from the enlarged uterus, which presses on the great abdominal veins and interferes with the return of the blood from the lower limbs. Added to this primary cause, any debilitated condition of the patient favors the formation of varicosities in the veins because of the general flabbiness and lack of tone of the tissues.

Naturally, the greater the pressure in the abdomen the greater will be the tendency to this complication, so that in twin pregnancies or in cases of contracted pelvis, where the gravid uterus is *relatively* much larger than normal, varices are very frequently seen. Also any occupation which keeps the woman constantly on her feet in the latter part of pregnancy causes an increase in abdominal pressure and so acts as an exciting factor. The most marked case of varicosities ever seen by the writer was in the case of a woman who kept a small bakery and luncheon-room and attended to her duties in the shop up to the hour of her confinement.

The first *symptom* of the development of varices is a dull, aching pain in the limbs due to distention of the deep vessels, and inspection will show a fine purple net-work of superficial veins covering the skin like lace. Later, the true varicosities

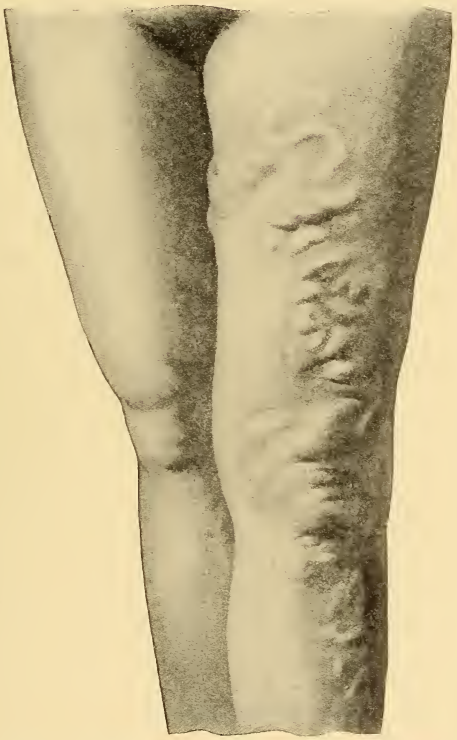


FIG. 33.—Varicosities of the lower extremities. (Bumm.)

appear, usually first under the bend of the knee, in a tangled mass of bluish or purplish veins often as large as a lead-pencil and suggesting a strong resemblance to a bunch of fish worms. As the condition advances the varicosities extend up and down the limb along the course of the vessels, and in severe cases affect the veins of the labia majora, the vagina, and the uterus.

The *treatment* consists first and chiefly in the prompt

abandonment, at the beginning of pregnancy, of garters, corsets, and all other articles of clothing that can cause pressure at any part of the body. If varicosities develop in spite of this precaution, the patient should spend a good part of the time in the recumbent position, and when she is on her feet the legs should be bandaged firmly from the ankles to the hips or fitted with elastic stockings. Where the general condition of the patient is below par the physician will prescribe iron or some other suitable tonic. Constipation is, of course, to be avoided, as an overloaded state of the bowels adds to the existing abdominal pressure. Every effort should be made to prevent the development of varices, for if they are once formed they never disappear entirely.

Hemorrhoids (piles) are nothing more than varicosities of the veins about the lower end of the rectum and the anus, and the little lumps and nodules seen in a mass of hemorrhoids are merely the distended portions of the affected vessels. Like varicosities in other places, they are due to pressure interfering with return venous circulation, and are aggravated by constipation. They often cause great distress to the patient, and their prominent symptom is a constant and painful desire to empty the bowel, which is called "rectal tenesmus," and is not relieved, but more often increased, by straining efforts at stool.

The *treatment* consists in relieving the constipation, in the use of hot compresses, and in the application of an ointment containing gallic acid, which can be obtained of any druggist, without a prescription, under the name of "nut-gall ointment." If these measures are not successful the case should be referred to the physician, who will doubtless prescribe suppositories containing opium or morphine.

Œdema (swelling) of the lower extremities is not of importance unless it is associated with albuminuria. If it causes much discomfort it may be relieved by rest in bed. When the swelling extends to the hands or face it is to be regarded with great suspicion as a possible forerunner of eclampsia, and the appearance of œdema in any part of the body should serve as an indication for the immediate examination of the urine.

Irritability of the bladder, characterized by frequent and often painful efforts at urination ("vesical tenesmus"), may occur at any time during pregnancy, but is usually most troublesome in the later weeks. If it cause great discomfort it should be reported to the physician, who may be able to relieve it by the correction of an abnormal position or presentation of the fœtus or by the administration of vaginal suppositories containing opium or belladonna.

Anæmia, of mild degree, is the normal condition of the blood during pregnancy, but at times it becomes sufficiently severe to call for the most active treatment.

In such cases the *onset* is usually gradual, and unless the patient is carefully watched her condition will become truly alarming before treatment is begun.

The *symptoms* of severe anæmia usually begin with headache, and the face becomes colorless and puffy. Œdema of the lower extremities begins and gradually ascends until it covers the entire body, and may even invade the serous cavities. The patient now loses flesh and strength rapidly, and suffers from sleeplessness, dizziness, headache, dyspnœa, and frequent attacks of fainting.

The *treatment,* of course, rests entirely with the physician, although the nurse can do much to *prevent the occurrence* of this severe type of anæmia by keeping a careful watch over the patient's general condition and encouraging her to exercise freely in the open air throughout the entire period of gestation.

No woman who sleeps well, has a good appetite for nourishing food, assimilates properly what she eats, and spends a fair portion of the time out of doors is in any danger of becoming markedly anæmic.

Diseases of the heart, and especially affections of the mitral valve, are greatly aggravated by pregnancy, and their fatal termination is often hastened from this cause.

If the patient has placed herself under medical care at the beginning of gestation, and if the physician has made a proper and thorough examination of all her organs at this time, he will

be in a position to administer such treatment as may be necessary. The only thing the nurse can do, when it seems to her probable that the heart is affected, is to report the matter at once to the medical attendant. Personally, the writer believes that these patients should not be allowed to go on in the pregnant state, but that abortion should be induced at the earliest opportunity after a positive diagnosis has been made.

Ascites (*dropsy*) may affect the extremities and even invade the pleural and peritoneal cavities. It is due to the altered condition of the blood, and the *treatment,* which should be wholly in the hands of the physician, consists mainly in the relief of the anæmia, the administration of diuretics, rest in bed, and milk diet.

Ptyalism, or salivation, while one of the rarer complications of pregnancy, is most annoying to the patient and very stubborn in responding to treatment. It is due entirely to altered enervation, and is characterized by an enormously increased secretion of saliva, so that the patient drools continually. Women have been known to discharge as much as two quarts of saliva daily from this cause.

Associated with ptyalism is occasionally seen an excessive secretion of tears, and the face becomes swollen and eczematous from being constantly bathed in moisture.

This complication, if it occurs at all, usually appears in the early months of pregnancy, and, fortunately, is inclined to cease spontaneously. It is seen in highly nervous women of low vitality and is apt to cause great mental depression and interfere with nutrition.

The *treatment* should be relegated to the physician, and consists in building up the general health with iron and arsenic and in the use of astringent mouth-washes accompanied by atropine and bromides, or chloral internally. The treatment is very unsatisfactory and the condition is a most disagreable one, not only for the patient, but for the physician and nurse as well.

Insomnia often proves troublesome, and is best relieved by strict hygienic methods, open-air exercise, and massage, supplemented by alcohol rubbing after the patient has retired for

the night. The sleeping-room should, if possible, be large and well ventilated, and so situated that the patient will not be subjected to any disturbing influences.

If these measures do not enable her to secure a proper amount of natural and refreshing sleep the physician should be consulted, and will doubtless order trional, sulfonal, or some similar drug. Under no circumstances should opium or morphine ever be administered in these cases.

Palpitation of the heart and syncope (fainting) are of no consequence unless it can be shown that they are associated with, and due to, some organic disease. As a rule, they are purely neurotic manifestations, and usually occur in the early part of a *first* pregnancy, and when the patient is in a hot, crowded, and badly ventilated room. So well is this tendency to faintness understood by the majority of women, that many significant glances are exchanged when a bride of a few months suddenly grows dizzy and has to be assisted from a theatre, ball-room, or other crowded assembly.

Neuralgia and headache occurring during pregnancy should be carefully investigated by the physician, and the nurse is to be cautioned against the indiscriminate use of the various popular remedies for these conditions.

Neuralgia, if facial, may be due to affections of the teeth, which require the attention of the dentist, and headache, while possibly of purely nervous origin, may be a symptom of severe constitutional disease.

In any event, it is safer for the nurse to refer these apparently trivial symptoms to the medical attendant than to attempt their treatment herself.

Paralysis occurs in certain cases, and may appear either before or after delivery. It may be due to uræmia, to cerebral congestion, or even to purely neurotic causes. Fortunately its outcome is usually favorable, and the treatment, of course, rests entirely with the physician.

Cough, unless due to a distinct bronchitis, is ordinarily of reflex origin and is unimportant. In the last months of pregnancy it may be due to direct pressure of the gravid uterus.

Leucorrhœa ("whites") occurs frequently in pregnancy, especially if the patient is debilitated and anæmic, and is characterized by a more or less profuse mucous discharge from the vagina. It is often relieved by hot vaginal douches of a solution of borax (one tablespoonful to the quart), given twice daily,—night and morning. The patient should lie on her back while taking the douche, so that the solution will reach every part of the vaginal canal, and at least two quarts, as hot as can be borne comfortably, should be used.

The nurse must keep in mind, however, the possibility of irritating the uterine muscle to contraction by the use of the douche and so causing a miscarriage. This is not likely to happen unless the douche is too hot or administered with too much force, but at the first appearance of pain, or even "bearing-down" sensations in the lower abdomen the irrigation should be discontinued at once, the patient kept quietly in bed, and the matter reported to the physician without delay. If this treatment is not successful, he may find, on examination, erosions of the cervix or other causes sufficient to keep up the discharge.

Pruritus (itching), when confined to the neighborhood of the vulva, is usually due to a coexisting leucorrhœa, and disappears when the leucorrhœa is cured. It may be relieved by hot applications or by the use of some preparation containing naphthol, such as "resinol ointment."

When the pruritus is general and covers the entire body it is almost always neurotic in character, though it may be due to a gouty diathesis or to diabetes. The treatment in such cases should be in the hands of the physician, and usually consists of rest in bed, regulated diet, the use of bromides in large doses, and the practice of thorough cleanliness, which applies to all degrees of pruritus, however slight. If the patient is gouty or is suffering from diabetes, these conditions will, of course, receive appropriate treatment.

Chorea, popularly known as "St. Anthony's," "St. John's," or "St. Vitus's" dance, is, fortunately, one of the rarest complications of pregnancy, for it is one of the most serious. It usually occurs in the early months of first pregnancies in very

young women, though it may develop at any time. As a rule, the history will show that the patient has suffered previously with the disease.

It may begin suddenly or insidiously, and is characterized by involuntary movements, or twitchings, of the arms and legs, which gradually become more and more marked and extend to other groups of muscles. There are exacerbations and remissions of the disease, and the movements regularly cease during sleep, to reappear again when the patient wakes. When the disease develops early in pregnancy the patient usually aborts, and in many cases it is necessary to induce abortion in order to save her life.

Any symptoms suggesting chorea should be reported to the physician without delay.

Displacements of the uterus may be of old standing or may occur after pregnancy is established. The symptoms of all types of displacement are practically the same, so far as the nurse is concerned, and consist chiefly in marked irritability of the bladder, excessive constipation, pains in the back and loins, and a feeling of weight and "bearing down" in the pelvis. Any such combination of symptoms should be reported promptly to the medical attendant, in order that he may correct the malposition before the pregnancy is too far advanced.

Albuminuria, complicating pregnancy, may be one of several types, and may occur as early as the third month, although it usually makes its first appearance at about the sixth month.

The diagnostic and only positive *symptom* is, of course, the presence of albumin in the urine, which should be discovered by the physician in the course of his regular urinary examinations. In properly conducted cases, where analyses of the urine are made systematically and at stated intervals, the discovery of albumin will be made before any other marked symptoms develop, and it often happens that suitable treatment can be instituted with sufficient promptness to ward off the impending attack. Hence it is of the utmost importance for the nurse to attend carefully to the collecting of specimens of urine at regular times and forwarding them to the physician for analysis.

In neglected cases the patient becomes anæmic, suffers from headache, which is chiefly frontal, and develops œdema, first of the ankles and legs, and later of the face and upper extremities. Ringing in the ears and dizziness soon become annoying symptoms, and disturbances of sight, such as double vision and the appearance of spots floating before the eyes, occur and increase as the albuminuria becomes more marked. In severe cases actual blindness may occur.

The urine becomes high-colored and scanty and the pulse is hard, small, and rapid.

Vomiting persists throughout the entire day, and is especially significant in women whose ordinary "morning sickness" has ceased.

In this disturbed state of the digestive system a slight attack of acute indigestion or the occurrence of any other ordinarily trivial disorder is enough to precipitate an eclamptic seizure. A woman in such condition is on the very brink of disaster, and the nurse should send at once for the physician, and while awaiting his coming put the patient in bed on an exclusive diet of skimmed milk and move the bowels freely with dessertspoonful doses of a saturated solution of Rochelle salt, given every fifteen minutes until free catharsis is established.

Eclampsia is a disease of pregnancy characterized by the occurrence of convulsions resembling somewhat those of epilepsy, and appearing, usually, late in pregnancy just at the onset of labor. It may develop, however, at any time during the last three months of utero-gestation, during labor itself, or, rarely, after labor has taken place.

The exact *cause* of eclampsia is not definitely understood, but it is safe to say that it is largely dependent upon deficient elimination of waste products from the maternal organism. Its threatened onset is indicated by the presence of albumin in the urine, by insufficient excretion of urea, or by both of these symptoms together.

The premonitory *symptoms* are those which have just been described as characteristic of albuminuria.

Eclampsia is very dangerous to the mother and almost uni-

formly fatal to the child, and these facts are all the more lamentable when it is remembered that, under proper management and with careful attention to diet and urinary examinations, the disease should be a wholly preventable complication.

Carelessness in the management of pregnancy and neglect of the necessary urinary analyses are, unfortunately, so much more often the rule than the exception that, although the writer has never lost a *mother* from eclampsia in his own practice, he knows of no less than eight deaths from this cause alone, and within the past six years, *among his own circle of friends and acquaintances.* Of these, one woman was a physician herself, and another, the mother of several children, had suffered from marked premonitory symptoms of eclampsia in all of her previous pregnancies, in spite of which no urinary examinations whatever were made by her physician and no special diet or treatment was given her.

Such lack of management is nothing less than criminal, and the writer hopes and believes that no reader of this book will allow any pregnant woman, no matter how well she may *appear* to be, to go through her pregnancy without proper urinary analyses, at least during the last three months.

After the woman has suffered from albuminuria, and has shown its characteristic symptoms for a varying period, she may, if the case has not been treated, have a miscarriage. This seems to be an effort on the part of nature to relieve her condition, for by the death of the child and its expulsion from her body the strain on her eliminative organs is lessened at least to the extent that she no longer has to excrete the waste products of the fœtus. More frequently, however, even if the child dies and an attempt at miscarriage occurs, she will pass into the eclamptic state and have the characteristic convulsions of the disease.

One attack is practically like another. The patient first complains of dizziness, and then everything grows black before her eyes. Her hands are clinched, with the thumbs drawn in; her head is drawn backward or to one side; her face is deathly pale; the corners of her mouth are drawn down, and the eyes,

open but rolled upward so that only the "whites" are visible, give to the countenance a particularly ghastly appearance. Now the large vessels in the neck begin to pulsate violently, the face grows gradually more and more cyanotic until it becomes almost black, and the glottis closes, causing respiration to stop.

In this condition the woman remains for from ten to twenty seconds, in a state of complete rigidity, after which, if death does not occur, her muscles gradually relax. Respiration now becomes rapid; she froths at the mouth, and may expel some blood if she has bitten her tongue; her arms and legs begin to twitch, and soon her entire body is in a state of violent convulsion. After three or four minutes this gradually ceases and the woman passes into a condition of coma, from which she emerges in a few minutes with no distinct recollection of what has taken place. In severe cases the coma may grow deeper and deeper until death occurs, or she may pass directly from one convulsion to another without regaining consciousness between the attacks.

If the nurse first sees a patient on the occasion of the occurrence of an eclamptic convulsion it will be necessary for her to make a diagnosis of the cause of the spasm, in order that she may proceed intelligently.

Practically the only conditions that might be confused with eclampsia are *epilepsy* and *hysteria,* and if the following points are borne in mind the nurse will have little difficulty in arriving at a correct opinion.

Eclampsia occurs in a woman who is *pregnant at least six months.* She has suffered during her pregnancy from the symptoms of albuminuria. Her face is swollen and her entire body is œdematous and puffy. Her friends will tell of her headache, vomiting, visual disturbances, and the like, and often inquiry will reveal the sad fact that her physician (if she has one) has not made any urinary examinations or ordered any special diet for her.

Her urine will be scanty and highly colored, and if a little is placed in a teaspoon and boiled over the flame of a match or gas-jet it will turn white and often solid from the coagula-

tion of albumin. This test is simple, quick, and absolutely conclusive, for, while there may have been little or no albumen in the specimen prior to the onset of the attack, it is sure to be present in large amount before many convulsions have occurred. The author can see no objection to the nurse's availing herself of this means of diagnosis unless the physician is close at hand and his presence can be secured without delay. If he has to be summoned from a distance, a positive report as to the highly albuminous state of the urine might be of value to him in making his preparations for the treatment of the case, while such knowledge would certainly aid the nurse in her management of the patient while awaiting the arrival of the medical attendant. As she comes out of one convulsion she may pass almost at once into another, and, even without a thermometer, it will be evident that she has considerable fever. She may have only one or two attacks and die, or miscarry and recover, or she may have fifty or sixty at intervals of from a few minutes to a few hours, any one of which may prove fatal.

Epilepsy occurs *independently of utero-gestation,* and if the woman chances to be pregnant it is merely a coincidence. The convulsion is generally ushered in with an outcry, and after it is over the patient passes into a sound sleep which may last for an hour or more. The attack will not be repeated for days, at least, and often it will be weeks or even months before another seizure occurs. There are none of the premonitory symptoms of albuminuria, and the history will show that the patient has long been subject to similar attacks. The nurse must, of course, be on her guard against those rare cases in which eclampsia occurs in a patient known to be an epileptic. The history of the albuminuria and the *time* of the attack (*during the last three months of pregnancy*), together with the recurrence of the convulsions at short intervals, the appearance of the patient, and the presence of fever, should be enough to settle the question.

Hysteria, like epilepsy, occurs independently of pregnancy, and if it happens that the woman is pregnant the hysterical attack may occur at any period of gestation. The convulsion of hysteria is not as severe as that of epilepsy or eclampsia, the

patient never loses consciousness completely, fever is not present, and the pulse and respiration are normal or nearly so, and the *urine*, instead of being scanty, concentrated, highly colored, and albuminous, is pale, of low specific gravity, and excreted in large quantity.

It is, of course, to be understood that *any convulsion* occurring during pregnancy is a sufficiently important matter to warrant the nurse in sending at once for the physician, and if the immediate services of the regular medical attendant cannot be secured she should lose no time in summoning the nearest available practitioner.

The *treatment* of eclampsia begins primarily with those preventive measures which should be instituted by the physician as soon as the pregnant woman comes under his professional care. These consist largely in the adoption of a proper hygienic *régime* which provides for a nourishing diet with the reduction of red meat to once daily, the careful regulation of the bowels, the practice of daily bathing to keep the skin in good working order, the indulgence in regular out-of-door exercise, and the daily ingestion of at least two quarts of pure water to act as a diuretic and otherwise "flush out" the system. When these measures are carefully followed, and the urine is examined at stated intervals for evidences of albuminuria, it should always be possible to avert a threatened eclamptic attack. Unfortunately, this plan can be put in operation only when the patient comes under observation at a comparatively early period of pregnancy, and in many cases the nurse will not be called to a case until shortly before labor.

Her first duty, under these circumstances, will be to ascertain if the patient's pregnancy has been properly managed and if the necessary urinary examinations have been made. This inquiry can always be conducted in a tactful way that will cast no reflection on the behavior of the attending physician, and if the nurse finds that the proper precautions have not been taken she is perfectly justified in making such suggestions as may be indicated concerning diet, exercise, and the like, and in securing a specimen of urine and sending it to the physician for analysis.

Moreover, during the last two months of pregnancy she should send a specimen of urine once a week to the medical attendant, whether it is asked for or not. This should be done entirely as a matter of course, for, in the light of modern obstetrics, no physician would dare to find fault with such a procedure even if he belonged to that, happily small, class of men who do not bother to make urinary analyses at these times. If the patient shows any general symptoms of threatened eclampsia, such as headache, visual disturbances, severe vomiting, and marked œdema, the physician should be sent for at once and his attention explicitly directed to her condition.

Occasionally the nurse will encounter the patient for the first time when she is in a convulsion, or the woman will have an eclamptic seizure shortly after the nurse's arrival or at some other time when there is no physician at hand.

After sending at once for the nearest medical man and assuring herself, from the character of the convulsion, the history of the case, the bloated appearance of the patient, and the albuminous state of the urine, that the attack is really due to eclampsia, the nurse may proceed as follows until assistance arrives. Let the patient lie where she is, whether it be in bed or on the floor, only moving her enough to place her in a reasonably comfortable position; insist upon absolute quiet in the room and the avoidance of all excitement; if chloroform is to be had, administer it as for a surgical operation until the convulsion has ceased, and while the patient is under the influence of the anæsthetic remove all her clothing, cutting the garments with scissors, and wrap her entire body (arms and legs separately) in a hot wet pack and cover her with warm blankets; empty the bladder with the catheter, disturbing the patient as little as possible; as soon as she can swallow give two drops of croton oil in one teaspoonful of sweet oil, if it can be obtained; whether the croton oil is given or not, make a saturated solution of Rochelle salt and give a dessert-spoonful every fifteen minutes until the bowels move freely. When the convulsion ceases insist upon absolute quiet, and do not allow so much as a whisper in the room; disturb the patient as little as

possible and only for the necessary purposes mentioned above; under NO circumstances attempt to change her position or put her in bed; KEEP THE CHLOROFORM CONSTANTLY AT HAND AND BEGIN TO ADMINISTER IT THE MOMENT THE NEXT CONVULSION STARTS. If the child is born and is alive, tie and cut the cord and remove it to another room; if it is dead, leave it alone, to avoid disturbing the patient, but in any case keep a hand on the fundus, UNDER THE HOT PACK, as a preventive against hemorrhage. If there is bound to be a considerable delay in securing the attendance of a physician, get thirty grains of chloral hydrate and forty grains of sodium bromide and give it by rectum. Beyond this:

Darken the room.

Maintain ABSOLUTE quiet.

Keep up the hot pack.

Do not disturb the patient under any circumstances.

Give chloroform whenever a convulsion occurs.

Secure medical aid as soon as possible.

WAIT till the physician arrives before doing anything else.

DO NOT LOSE YOUR HEAD.

HEMORRHAGE from the uterus may occur at any time during pregnancy, and while it may be due to high arterial tension or to erosions or ulcers of the cervix, and so be of no special consequence, it may, on the other hand, be of serious import; *and all attacks of bleeding should be reported at once to the physician.*

In the early months of pregnancy hemorrhage may be due to a beginning abortion or the case may be one of ectopic gestation. In the later months the bleeding may indicate placenta prævia or be due to the separation of a normally situated placenta from the uterine wall. These four conditions will be described in detail later on, but so far as the nurse is concerned the *general treatment* of hemorrhage occurring during pregnancy is the same in every case: Send at once for the physician; put the patient in bed and make her lie still on her back; reassure her in every way possible, and avoid all noise and every suspicion of excitement on the part of her friends and relatives; if she

is very nervous or if the hemorrhage seems at all severe, give one-sixth grain of morphine hypodermically.

If the bleeding continues, a sharp watch must be kept for symptoms of acute anæmia, and it may be necessary to send for the nearest physician available instead of waiting for the arrival of the regular medical attendant. When the blood escapes into the bed, as in the case of placenta prævia, the amount of the flow should be enough to indicate the proper course to pursue, but it must be remembered that in certain instances, as, for example, when a normally situated placenta becomes detached from the uterus, the woman may bleed to death INSIDE OF HER OWN BODY and little or no blood escape from the vagina (see Fig. 103). In such a case the symptoms indicative of danger would be those of severe hemorrhage from any other cause.

The patient would be pale, and her pallor would increase as the bleeding continued; she would be extremely nervous and restless, and her face, bathed in a cold sweat, would have an anxious and "wild" expression; her pulse would grow more and more rapid and feeble, and finally would disappear entirely at the wrist; her thirst would be extreme, and she would soon complain of ringing in the ears, dizziness, spots before the eyes, and at last total blindness; towards the end would be seen that horrible condition known as "air hunger," in which the patient literally tries to bite the air as she would a solid substance, so great is her need of oxygen.

Under these circumstances the nurse can do nothing beyond getting medical aid as soon as possible and preparing for the probability of a surgical operation, with plenty of hot water and hot, sterile, normal salt solution for infusion.

PAIN in the region of the uterus may be merely neuralgic in character and of no consequence beyond the discomfort that it causes, but its occurrence should always be reported to the medical attendant, as it is one of the symptoms of abortion, of ectopic gestation, of concealed hemorrhage, and of many of the diseases that may complicate pregnancy, such as appendicitis and various other disturbances of the abdominal organs.

ECTOPIC GESTATION, occasionally and incorrectly termed

"extra-uterine pregnancy," means, literally, a pregnancy that is "out of place." In the chapter on Fetal Development it was said that the ovum is usually impregnated by the male element while it is still in the Fallopian tube, after which it passes on into the uterus. If, now, anything occurs to prevent its passage into the uterine cavity, it will either develop where it is or else, in very rare instances, fall out of the open trumpet-shaped end of the tube and develop in the cavity of the abdomen. If its progress towards the uterus were not interfered with until it reached that portion of the tube which lies within the uterine wall, it would be *in the uterus,* although decidedly *ectopic* or *"out of place,"* which explains the incorrectness of the general term "extra-uterine pregnancy."

This accident may be caused by a narrowing of the tube due to a constriction within itself; to folds or twists of the tube which may be the result of accident or disease; to pressure from pelvic organs or tumors; or it may occur with a very long tube or when the impregnation takes place close to the ovarian extremity, so that before the ovum reaches the uterus it has developed to such a size that it is too large for the canal through which it is supposed to travel.

In any event it becomes firmly lodged at some point and development proceeds, up to a certain stage, as though it were safe within the uterine cavity.

The most common form of ectopic gestation is that which goes on in the tube itself, and is called *"tubal pregnancy"* (Fig. 34); the next most frequent type occurs in that portion of the tube which lies within the uterine wall, and is termed *"interstitial pregnancy;"* and the rarest form of all is known as *"abdominal pregnancy,"* in which the ovum develops in the abdominal cavity. Neither tubal nor interstitial pregnancy ever goes on to the full development of a living child, but occasionally, when the ovum falls into the cavity of the abdomen, the placenta attaches itself to some viscus and the fœtus develops to full term and is removed by abdominal section.

In all cases of ectopic gestation the woman exhibits, to a certain degree, the usual early symptoms of pregnancy, and, as

a rule, regards herself as being normally with child. The uterus enlarges somewhat, the irritability of the bladder and the breast symptoms appear, and the patient suffers more or less from "morning sickness." Her menstruation may cease entirely, but there is usually a slight flow at each monthly period due to congestion of the lining membrane of the uterus. This may be only enough to stain the napkin for one day, and although such a "show" may occur in the early part of a normal pregnancy, it is entirely unnatural and sufficiently suspicious to warrant the

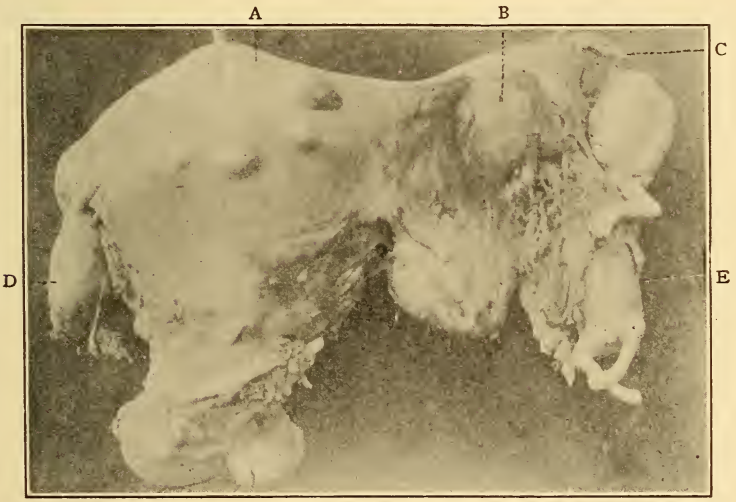


FIG. 34.—Ectopic gestation. Tubal variety, ruptured at the end of the third month: A, uterus from behind with several small fibroid tumors in its wall; B, right ovary; C, ruptured tube; D, left ovary; E, fœtus.

nurse in sending for the physician or at least advising him of its appearance.

As the ectopic gestation advances there will be considerable pain of a sharp, shooting character on the side of the affected tube and extending down the leg. This pain is due to the stretching of the tissues of the tube or uterine wall, and any such combination of pain and slight bleeding should be brought to the notice of the medical attendant without delay.

In abdominal pregnancy the condition may not be recognized

until the case has gone on to full term, when, as labor does not occur, a careful examination will disclose the true state of affairs. In unrecognized abdominal pregnancy the child will die, and may cause the death of the mother from peritonitis, or it may become mummified and remain in the belly indefinitely or else adhere to the abdominal wall and eventually slough out in the form of an abscess.

Cases of tubal and interstitial pregnancy, unless recognized and operated upon, will rupture into the abdomen sooner or later (usually between the first and third months), and the patient may bleed to death or die of peritonitis or shock.

A ruptured ectopic sac would be diagnosed by the history of the early symptoms of pregnancy, the excruciating pain at the time of the rupture, the occurrence of collapse, and the rapid onset of signs of severe internal bleeding.

The nurse can only send at once for surgical aid, keep the patient perfectly quiet, and prepare for an abdominal section.

While it is possible that the hemorrhage will stop and the products of conception be absorbed, the bleeding is usually very severe, and only the most energetic action succeeds in saving the life of the patient.

Placenta prævia (Fig. 35) signifies an attachment of the placenta directly over, or in the immediate neighborhood of, the cervix instead of at its usual site near the fundus of the uterus. When the placenta completely covers the internal os the condition is known as *"central placenta prævia;"* when merely the edge of the placenta extends over the opening it is termed *"marginal placenta prævia;"* and when the placenta is simply attached low down on the uterine wall, near the os but not overlapping it, it is called *"lateral placenta prævia."*

In any case the condition forms a distinct obstruction to delivery, and the first *symptom* is a *sudden discharge* of bright red blood *without any pain* and apparently for no particular reason. The first hemorrhage is rarely fatal, but any subsequent one may result in the death of the mother before any surgical assistance can be obtained. At the first appearance of bleeding of this character the nurse should send the patient to bed, give one-

sixth grain of morphine hypodermically, summon the physician, and prepare for an immediate operative delivery,—usually a version. It is needless to say that all preparations for labor should be made without the patient's knowledge, to avoid the possibility of causing her any alarm.

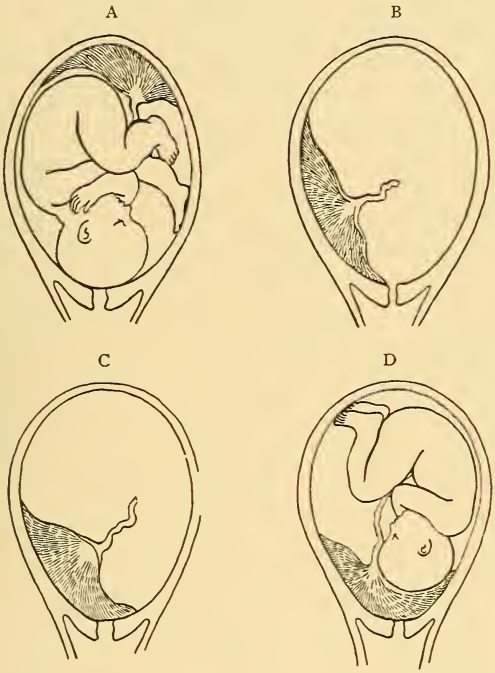


FIG. 35.—Placental attachment. A, normal attachment at the fundus; B, lateral placenta prævia; C, marginal placenta prævia; D, complete, or central, placenta prævia.

HEMORRHAGE due to the detachment of a normally situated placenta may show itself externally or it may be entirely concealed, the blood remaining in the uterus and finding room for itself by collecting between the fetal sac and the uterine wall (see Fig. 103). In such a case the only symptoms would be those of severe internal hemorrhage already described, together with excruciating pain located at the point of placental separation. These cases of concealed hemorrhage are often very difficult to

diagnose, but the nurse would at least know that something serious was the matter, and in putting the patient to bed, giving morphine for the pain, and sending at once for the physician she would relieve herself of further responsibility. The symptoms of concealed hemorrhage from placental separation are practically the same as those caused by rupture of the uterus, but when it is remembered that the placental detachment always occurs BEFORE, and the rupture of the uterus DURING, labor, it will not be a difficult matter to distinguish between the two conditions.

NOSE-BLEED occasionally occurs late in pregnancy or early in labor, and is due to the existing hydremic condition of the blood, coupled with a congested state of the nasal mucosa. It is seldom troublesome, but, in certain rare cases, it proves very intractable, and may persist until the patient loses an alarming quantity of blood. Such cases are, of course, very unusual, but the possibility of their occurrence should be kept in mind, and any profuse hemorrhage from the nose should be reported to the physician.

Slight hemorrhages from the stomach or lungs, also due to the existing hydremia and from areas of local congestion, are occasionally met with late in pregnancy, and, unless it can be shown that they are due to other causes, such as a gastric ulcer or pulmonary tuberculosis, they are seldom of any moment. They are, however, usually more alarming to the patient than would be a really serious nose-bleed, and, of course, they should be reported to the medical attendant at once. While awaiting his arrival or advice the patient should lie quietly on her back and take small bits of cracked ice at frequent intervals.

THE ERUPTIVE FEVERS, when affecting a pregnant woman, are always exceptionally severe, and if the temperature is at all high, abortion or miscarriage is almost certain to occur.

SCARLET FEVER is particularly fatal during pregnancy, and very little hope can be offered to the woman who contracts the disease at this time.

PNEUMONIA in pregnancy is usually very fatal to both mother and child, although, when abortion occurs, as it often does, the maternal chances are somewhat improved.

Tuberculosis shows apparent improvement during pregnancy, but, as a matter of fact, its fatal outcome is probably hastened, for the woman's decline is usually very rapid after the birth of the child.

Malaria is very apt to cause abortion, either by reason of its high temperature or because of the large doses of quinine given for its control. It must be said, however, that physicians practising in malarial districts give quinine to pregnant women without any regard to its oxytocic properties, and claim that under these conditions—that is, when given to a pregnant woman who is actually suffering from malaria—it has no tendency to cause miscarriage. In any event, the physician is between two horns of a dilemma when he encounters severe malaria complicating pregnancy, for if quinine is not given, through fear of causing abortion, the high temperature of the disease will most probably do so.

Syphilis is the *most common* cause of all abortions, and a syphilitic patient should be under active treatment from the very beginning of gestation if she wishes to be at all certain of going to term and giving birth to a living child. The nurse should remember that syphilis is often encountered where it is least expected, and that her professional acquaintance with the disease will by no means be limited to her hospital training.

All of the eruptive fevers, syphilis, tuberculosis, malaria, and lead and sewer-gas poisoning may directly affect the fœtus in utero, and although the last two conditions do not cause any very serious disturbances if the child lives, they are very apt to cause abortion at an early period.

VIII

The Signs and Symptoms of Pregnancy

As stated in the introductory chapter, it is highly desirable for the pregnant woman to be under medical care from as early a date as possible, and as women who suspect that they are pregnant are very apt to discuss the matter with a nurse before consulting a physician, the first duty of the nurse under such circumstances is to advise the patient of the importance of seeking medical counsel at once.

More than half the women who present themselves at the physician's office late in pregnancy have nurses engaged for their confinements, and yet it seldom happens that these patients visit the physician by the direction of their nurses. In short, it would seem that nurses and physicians do not work together in such matters to the extent that they should, and it rests with the nurses to bring about a more harmonious state of affairs.

Naturally, before advising a patient to consult a physician in regard to a suspected pregnancy, the nurse will wish to be reasonably sure in her own mind that conception has actually occurred.

There are many signs and symptoms which point to the existence of pregnancy, some of which can readily be recognized by the nurse, while others can only be made out accurately by one who has had a thorough medical training.

Of these signs, but three are absolutely indicative of pregnancy, and of these, two may be absent if the fœtus has died in the womb. Moreover, these "positive" signs are not present until about the middle of gestation, when the physician can usually make a diagnosis without them by the "circumstantial evidence" of a combination of earlier and less significant symptoms.

While, in the great majority of cases, the early diagnosis of pregnancy is extremely easy to one familiar with such condi-

tions, it occasionally presents many difficulties, even to the skilled observer, and in rare instances no positive statement can be made until one or another of the three positive signs has appeared.

The signs of pregnancy are divided by most writers into three groups, and in the following table those which are appreciable to the educated nurse are printed in heavy-faced type.

A. PRESUMPTIVE SIGNS.

1. **Menstrual Suppression.**
2. **Vomiting. ("Morning Sickness.")**
3. **Irritability of the Bladder.**
4. **Mental and Emotional Phenomena. ("Morbid Longings, etc.")**

B. PROBABLE SIGNS.

1. **Mammary Changes. (Enlargement of the Breasts, Shooting Pains, Pigmentation, etc.)**
2. Bimanual Signs. (Size of Uterus, Hegar's Sign, etc.)
3. **Abdominal Changes. (Size, Shape, Pigmentation, etc.)**
4. Changes in Cervix. (Size, Shape, Consistency, etc.)
5. **Violet Color of the Vaginal Mucous Membrane.**
6. Uterine Murmur.
7. Intermittent Uterine Contractions.

C. POSITIVE SIGNS.

1. Passive Fetal Movements. ("Ballottement.")
2. **Active Fetal Movements. ("Quickening.")**
3. Fetal Heart Sounds.

CESSATION OF MENSTRUATION AND MORNING VOMITING are placed first in the list of Presumptive Signs because the former is the symptom usually first noticed by the patient and the latter is the one that is most likely to bring her to the physician.

The writer has found, however, that *irritability of the bladder,* characterized by very frequent and often more or less painful voiding of the urine, is apt to be the first symptom of

pregnancy. This may occur very shortly after conception and before the next menstrual period is due, and as it is often ascribed by the patient to "catching cold," or to some other trivial cause, it is not, as a rule, mentioned, except in response to the questioning of the physician. This irritability is due to the pressure, on the bladder, of the recently impregnated uterus, which has a tendency to tip forward and settle down deeply in the pelvis, and, when accompanied or followed by stoppage of the menstrual flow it is, in a married woman, very suggestive of pregnancy.

If this combination of symptoms is followed by *vomiting* on arising in the morning, or even by *nausea* at this time, the diagnosis becomes more probable than ever.

The usual *character* of this form of vomiting is that of a sudden, paroxysmal emptying of the stomach, occurring the moment the patient gets out of bed. Under normal conditions, it may continue until about noon, the stomach promptly rejecting any food or drink that may be swallowed. After twelve or one o'clock the irritability of the stomach usually ceases, and the patient has no further trouble or discomfort until the next day, when the whole affair is repeated. This symptom begins, as a rule, about the end of the second month, but it may be noticed at any time after conception has occurred, even as early as the third or fourth day. It generally stops by the end of the fourth or fifth month, and vomiting occurring late in pregnancy is always to be regarded with suspicion, as indicative of some severe systemic disturbance of toxæmic origin.

Mental and emotional phenomena are, fortunately, not very common, but they may be noticed in some cases. For example, a woman of the most amiable disposition may, under the influence of pregnancy, become exceedingly disagreeable and fretful, while, on the other hand, one of great asperity may, rarely, go to the opposite extreme and take on the qualities of a veritable saint. In the same way, articles of food and forms of amusement, ordinarily unthought of, may suddenly be demanded, and in rare instances the most unusual and even disgusting impulses may be fostered. The writer has had recently under

his care a woman who, when pregnant, developed an irresistible appetite for raw potatoes.

The CHANGES IN THE BREAST include enlargement of the entire gland on both sides; a sense of fulness, and shooting or tingling pains in these organs; and darkening of the tissues surrounding the nipples (Fig. 36). Temporary slight enlarge-

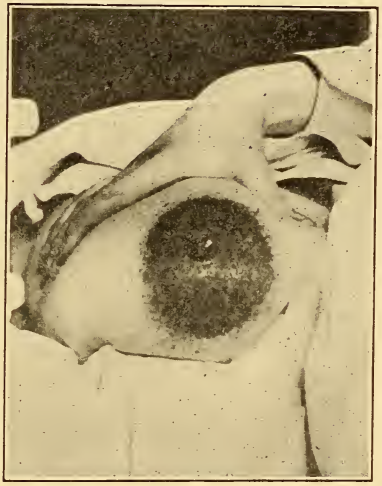


FIG. 36.—Marked pigmentation of breast. Tubercles of Montgomery and a drop of milk on the nipple plainly shown.

ment of the breasts and sensations of weight and fulness are, of themselves, of no significance, for, in many women they may be noticed at the ordinary menstrual periods, but the darkening of the areola around the nipples and the presence of a silvery white fluid (colostrum), which can be squeezed out of the breast, constitute, in a woman who has never borne children, very significant signs of pregnancy. If, however, the woman has had a child, the areolar pigmentation from the previous pregnancy will remain, and it is not unusual for colostrum to be present for months or even years after it has once appeared. Thus, while it is apparent that these breast symptoms are not of much account in the case of a woman who has borne chil-

dren, they are of great significance if the patient has never been pregnant before.

The ABDOMINAL CHANGES are supposed to begin with a flattening of the abdominal wall in the early weeks of gestation, due to the tipping forward and sinking of the uterus, to which reference has already been made as causing irritability of the bladder. This supposititious flattening has given rise to the old French saying,—

"Ventre plat,
Enfant il y a;"

which doggerel, being translated freely and with equal poetic feeling, would read,—

"In a belly that is flat
There's a child, be sure of that;"

but, as King has said, "One can't be sure of that," by any means. In the first place, the uterus at this time is so small that no change in its position would have any tendency to appreciably flatten or otherwise affect the contour of the abdominal wall, and even if such a change did occur it would be so slight that it is highly improbable that it would ever be noticed by the patient or brought to the attention of the physician or nurse.

The PIGMENTATION OF THE ABDOMEN (see Fig. 32), extending up the median line and surrounding the umbilicus is, in a woman who has never borne children, almost diagnostic of pregnancy, but, like the pigmentation of the breast, it varies exceedingly in different subjects, being often entirely absent in decided blondes and exceptionally well marked in pronounced brunettes. In women who have borne children previously this pigmentation remains from the former pregnancies, and cannot be depended upon as a diagnostic sign.

The SIZE OF THE ABDOMEN in pregnancy corresponds with the increase in the size of the uterus, which, at the end of the third month is at the level of the symphysis pubis, at the end of the sixth month at the level of the umbilicus, and towards the end of the ninth month at the ensiform cartilage (Fig. 37).

Mere abdominal enlargement may be due to a number of causes, such as an accumulation of fat in the abdominal wall, dropsy, uterine or ovarian tumors, and the like. If, however, the uterus

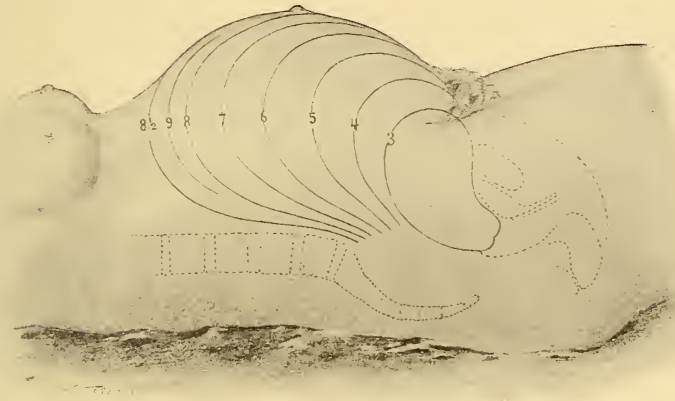


FIG. 37.—Size of the uterus at each month of pregnancy. The fundus reaches the symphysis at the third month, the umbilicus at the sixth month, and the ensiform cartilage at the middle of the eighth month, after which it sinks a little before labor begins.

can be distinctly felt to have enlarged in the proportions stated above, pregnancy may properly be suspected. The nurse cannot be expected to make out this uterine enlargement until the fundus is well above the symphysis, so this sign is of no value to her as a means of early diagnosis.

The nurse will hardly be called upon to inspect the *vaginal mucous membrane* for evidences of pregnancy, but it may be said that, owing to pressure and consequent congestion within the pelvis, this mucosa becomes thickened and of a dark violet or purple color instead of its customary pinkish tint in the non-pregnant state. This sign is of no special value in women who have borne children, and as it may be due to any form of congestion or to the presence of new growths or varicosities within the pelvis, it is very unsatisfactory at best.

PASSIVE FETAL MOVEMENTS ("ballottement") can only be made out by the physician skilled in obstetric examinations, but the ACTIVE MOVEMENTS of the fœtus within the womb are readily

recognized after the fifth month by placing the hand firmly against the abdominal wall over the uterus and holding it there until the fœtus is felt to kick vigorously, as it does every few minutes. This sign is unmistakable to the examiner, although the patient may sometimes imagine the movements of gases in the intestines to be the motions of a fœtus within the uterus. If the child is dead these movements will not be felt, but there will usually be a history of the previous occurrence of such fetal activity.

The SOUNDS OF THE FETAL HEART are often heard with great difficulty by the physician, and it is not to be expected that a nurse will always be able to make them out. Occasionally, however, in the latter months of pregnancy and with all conditions favorable, the nurse will be able to hear the fetal heart-beat, like the ticking of a watch under a pillow, by placing the ear firmly against the abdominal wall.

The fetal heart should make from one hundred and thirty to one hundred and fifty beats to the minute, and is absolutely distinct from the maternal pulse. Like active fetal movements, this sign will not be discovered if the child is dead.

Having decided, from one or more of the above signs, that the woman is probably pregnant, or if there is any doubt as to her condition, she should be directed to consult, at once, the physician who is to attend her during her confinement.

The PROBABLE DATE OF THE LABOR may be computed by taking the first day of the last menstruation, counting back three months, and adding seven days. This will give a date which is to be regarded as the middle of a period of two weeks during which the labor may be expected to occur. Thus, if the woman's last menstruation began on June 14, count back three months to March 14 and add seven days, making March 21. She may then be told that her labor will probably take place between March 14 and March 28. Remember that this is merely an approximate date, for the exact time of impregnation can seldom be determined, and it is not at all certain that the woman will go her complete term of two hundred and eighty days after impregnation, even if that date were positively known.

IX

The Management of Pregnancy

When the pregnant woman consults the physician in reference to her condition, he will first determine the duration of the gestation and the probable date of the expected labor, and then give the patient some general hygienic rules for her guidance during her pregnancy.

It is not only proper, but important, for the nurse to have a clear understanding of the nature of these directions.

Corsets and any other garments that constrict or compress the chest, waist, or abdomen must be laid aside from the first and the skirts supported from the shoulders by means of some form of "corset-waist," of which the "Ferris waist" is a well-known type.

The reasons for this rule are many and important. In the first place, anything that compresses the chest retards greatly the development of the breasts, which should be marked during pregnancy, and by so doing tends to flattening or even depression of the nipples. Both these conditions will interfere with the function of lactation, even if they do not render it entirely impossible, and as the proper performance of nursing has a direct and powerful effect on the involution of the uterus and its return to its normal condition after labor, any such interference exerts a most unfavorable influence on the convalescence of the mother as well as upon the health of the infant thus deprived of its logical form of nourishment.

Moreover, pressure on the chest wall, especially as it is increased from day to day by the gradual enlargement of the breasts without any compensating loosening of the corsets, prevents necessary expansion of the lungs and hinders the working of the heart, already hypertrophied as a normal result of pregnancy. The harmful consequences of such conditions can readily be seen, for it is not difficult to understand that a woman

who has to supply oxygen for herself and another being, and who must eliminate, with her own blood, the waste products of an unborn infant as well as those of her own body, must necessarily have her respiratory and circulatory organs unhampered if she is to perform these tasks in a thoroughly normal way.

FIG. 37*a*.—Berthé May's maternity corset.

The injurious results of pressure about the *waist* and *abdomen* are much the same. Respiration is affected by interference with the play of the abdominal muscles and the diaphragm; circulation is impeded by pressure on the large abdominal blood-vessels; the normal action of the kidneys, liver, and digestive organs is seriously hampered; and, lastly, the full development of the infant is markedly interfered with.

The use of corsets and the practice of "lacing" during pregnancy are usually due to a desire on the part of the mother to conceal her condition as long as possible, coupled with ignorance of the disastrous results that may, and often do, follow the employment of such means of concealment.

Most women will abandon these devices at once when their dangers have been carefully explained, but, if abdominal pressure seems to be absolutely necessary, the author can highly recommend the most excellent Maternity Corset made (to measure only) by Mme. Berthé May, No. 125 West 56th St., New York City. This garment may be ordered by mail if measurement blanks are se-

cured (Fig. 37*a*). Incidentally, it may be mentioned that loosely fitted garments do more to conceal the progressive abdominal enlargement of pregnancy than can be accomplished by any method of lacing or other mode of constricting the figure.

Undergarments should be made of *wool,* of a weight suited to the season of the year, and should extend down to the ankles and cover the arms to the wrists.

Wool is insisted upon, to the exclusion of cotton or linen, because it absorbs perspiration as rapidly as it is excreted, and so keeps the skin dry at all times. When the integument is damp with perspiration, as it is in hot weather or after exertion, if cotton or linen underwear is worn, any sudden chilling of the surface will close the capillaries and drive a considerable amount of blood to the interior of the body, causing congestion of the internal organs. At the same time, this chilling of the surface and contraction of the capillaries prevent further perspiration, and so throw an additional strain on the kidneys, now congested through increased blood-supply and overworked by the addition of fetal to the maternal elimination.

Outer garments are to fit loosely, and must be enlarged as freely and as frequently as occasion requires. Décolleté gowns are strictly forbidden at any time during pregnancy.

Garters that encircle the leg tend to the development of varicose veins in the lower extremities, and are to be discarded in favor of some form of stocking supporters attached to the corset-waist or extending over the shoulders. It will be remembered that arteries have muscular tissue in their walls, while veins have none, and that arteries stand open when empty, while veins collapse. Hence any constriction of an extremity affects the veins far more than the arteries, and blood, which meets with no obstruction whatever in its flow down the extremity through an artery, will, on its return through the vein, find at the point of constriction sufficient closure of the vessel to dam it back and so stretch the vein wall that a varicosity is formed. As there is already a marked tendency in this direction, by reason of the enlarged and constantly enlarging uterus impeding return circulation from the lower extremities by com-

pression of the great abdominal vessels, anything like corsets or garters tends to aggravate the condition. In fact, garters that encircle the leg should never be worn under any circumstances, even by unmarried women, for the tendency to varicosities is always present, and when once they are formed they not only never disappear but grow worse from year to year.

Exercise in the open air should be taken daily throughout the entire course of pregnancy, and, of all forms of exercise, *walking* is, without question, the best. Smooth roads are to be selected for the daily jaunts, and they must be so regulated as to distance that the woman will arrive home exhilarated, but just within the point of fatigue.

A woman of ordinarily good physique, beginning her walks early in pregnancy, should start with about one mile and increase the distance half a mile a day until six miles are covered. When this distance is reached it is to be regarded as the regular daily task *if it can be accomplished comfortably,* but if it prove to be exhausting it must be cut down to a more suitable length.

While six miles a day is not too much for a strong healthy woman accustomed to out-door life, and may safely be taken as a standard for comparison, it must never be forgotten that many patients of frailer constitution can be allowed only two or three miles a day, and no woman should ever be urged to undertake more than her strength will permit.

The *final test lies in the condition in which the patient returns home.* If she is tired and worn out, the distance has been too great, while if she is invigorated and refreshed at the end of her walk, it has been beneficial.

Moderately stormy days need not interfere with the usual outing if the woman is properly dressed for the weather, with rain coat, high storm boots, and rubbers or overshoes. The dangers of chilling the body, and consequent congestion of the internal organs, must always be kept in mind, and if, by any accident, a pregnant woman is inadvertently exposed to inclement weather and returns home cold and exhausted, steps must be taken at once to stimulate surface circulation and restore warmth to the body.

A hot drink of tea, or whiskey and sweetened water, should be given, and then, after all clothing has been removed, the patient is to be rubbed vigorously, wrapped in warm blankets, and surrounded with hot water bottles, or, if they are not available, with hot flat-irons or hot stove-lids.

As soon as she is perfectly comfortable and entirely free from all chilly sensations, the blankets are removed and she is again rubbed briskly with warm diluted alcohol and dressed in warm clothing, unless she prefers to remain in bed between sheets. She is to lie in the blankets only long enough to get thoroughly warm and not until she begins to perspire. The hot whiskey is not to be repeated, but small quantities of hot tea may be given from time to time.

Walking is preferred during pregnancy to every other form of exercise, because it stimulates the muscular activity of the entire body, and in the later months it distinctly favors the descent of the fetal head into the pelvis, insures complete flexion, and shortens materially the first stage of labor. Moreover, it is available to all women, no matter what their circumstances in life may be. It should be kept up to the very end of pregnancy, and in the last months, when the patient's condition is noticeable, the walks may be taken after dark to avoid the embarrassing glances of passers-by.

Aside from walking, there are very few forms of out-door exercise that meet the requirements of the pregnant woman. *Horseback riding* is too violent and driving not sufficiently invigorating; *tennis* is too uneven and tiresome, and *croquet* too tame and uninteresting; while *golf* in moderation and *bicycling* over smooth roads are debatable questions, and may possibly, be permitted. *Walking* is the best of all, and if any of the other permissible forms are allowed it should be only at rare intervals and on special occasions. This is especially true of all forms of OUT-DOOR GAMES, for the patient's spirit of emulation and her desire to make a good showing, if not to be the winner, may result in overtaxing her strength to a serious degree.

Of IN-DOOR EXERCISE there is only one form worthy of con-

sideration. This consists in stimulating the abdominal muscles by lying on the back on the bed or floor and, with the arms folded over the chest or the hands clasped back of the head, rising to a sitting posture without drawing up the legs or raising the heels. This is to be repeated several times until a slight sense of fatigue is experienced, and should be begun early in pregnancy and practised twice daily, in the morning before arising and at night just after retiring.

If this form of exercising the abdominal muscles is found to be too difficult, as is often the case, the patient may, instead, lie on her back and raise the feet slowly in the air, first one foot at a time and then both feet together. This should be done several times until a slight sense of fatigue is experienced.

Dancing, ping-pong, and the like are strictly forbidden, and the SEWING-MACHINE, a most potent factor in the causation of miscarriages, must never be used in pregnancy. The lifting or carrying of heavy weights, all unnecessary stair-climbing, and every form of violent exertion must studiously be avoided.

BATHING at frequent, stated intervals is of the utmost importance, and baths should be taken daily during the hot summer months, and not less than three times a week in cooler weather. Warm water and an abundance of soap are to be used, for it is essential to keep the skin in good condition and the pores free, lest perspiration be interfered with and too great a strain be thrown upon the kidneys.

The relation of perspiration to the action of the kidneys is little understood by the laity, and most persons are unaware that the skin of an adult excretes, in twenty-four hours, from one and one-half to two pints of fluid, or nearly as much as is eliminated in the form of urine, and that if perspiration were to cease entirely, the kidneys would be unable to perform the double task which would be required of them, and death would inevitably result within a few hours.

This fact was most tragically proved in Paris many years ago when a little boy, chosen, because of his unusually beautiful form, to represent an allegorical figure at a national festival,

was covered completely with gold leaf to simulate a golden statue, and died in a few hours of uræmic convulsions merely because perspiration was completely stopped and the kidneys were unable to bear the extra burden.

Baths are best taken at night, just before retiring, to avoid the danger of "catching cold," but a morning bath may be allowed, even with tepid or cool water, if the patient has always been accustomed to one. The shower-bath or spray cannot with safety be permitted at any time during pregnancy. Salt water "still" bathing is usually beneficial when practised under proper conditions, but surf bathing is distinctly contraindicated throughout the entire period of gestation.

SLEEP, in greater amount than usual, is required by the pregnant woman, and, in addition to the regular sleep at night, a nap of one or two hours in the afternoon is highly desirable. *If the patient is unable to sleep in the daytime, the afternoon nap should not be entirely given up, but she should lie down on the bed or couch and rest quietly for an hour or two every day.*

The bedroom should be of good size, in a quiet part of the house and thoroughly well ventilated. Even on the coldest winter nights a window can be opened a few inches at the top and bottom to insure a free circulation of fresh air. If the bed is, necessarily, so situated that it is in the direct line of draft, a screen may be placed at its side, or, if such a piece of furniture is not available, one may be improvised with a kitchen clothes-horse, covered with a sheet.

The TEETH of a pregnant woman are apt to undergo certain destructive changes, which have given rise to the old saying, "For every child, a tooth." This disorder is supposed to be due to increased acidity of the saliva, which is itself increased in amount, and it may result in caries of a rapidly progressing type. In addition, the gums may grow soft and spongy, and even bleed or become ulcerated. In rare instances there is a persistent toothache, not due to any lesion of the tooth or gums, but of reflex origin. As a precautionary measure, the woman should have her teeth examined and put in order by a competent

dentist early in pregnancy, for painful or protracted dental operations performed during the period of gestation have been known to bring on miscarriage.

After the teeth have been thoroughly cleaned and any existing cavities temporarily filled, further trouble can usually be averted by the frequent and systematic use of an alkaline mouth-wash. Phillips' "Milk of Magnesia" meets this indication perfectly, and, after brushing the teeth, the mouth should be rinsed with a properly prepared solution before and after each meal, as well as after arising and before retiring.

If the teeth have been properly put in order by a dentist in the early weeks of pregnancy, and if this after-care has been faithfully followed out by the patient, any pain or soreness of the teeth, mouth, or gums which does not subside promptly should be reported at once to the physician.

The DIET of the pregnant woman is to be carefully regulated, and only such articles of food are to be taken as will not overtax the already hard-worked kidneys. The appetite at this time is often enormously increased, especially in the case of a strong, healthy woman in whom there are no abnormalities and whose pregnancy is progressing favorably.

To gratify to its full extent this abnormal desire for food, which is most marked after the fourth month, when the morning nausea or vomiting has disappeared, is extremely dangerous to both the mother and child. Professor Hirst speaks of a case, seen by him in consultation, in which a primigravida who had not only been allowed full sway in the matter of diet, but who had been directed by her physician to drink two quarts of milk daily, between meals, was delivered, with the utmost difficulty, of a child weighing eleven and three-fourths pounds. Later, under a properly regulated diet, she was delivered, with comparative ease, of a perfectly healthy, well-developed child which weighed but seven and one-half pounds.

Thus, it is evident that an unrestricted diet will, if it does nothing more, tend to overgrowth of the fœtus and, consequently, to serious complications at the time of labor.

While this state of affairs is sufficiently bad, such a child

could, if necessary, be delivered by Cæsarean section, which, amid favorable surroundings, and performed by a skilful operator on a healthy woman, would, under modern surgical methods, doubtless result successfully.

There is, however, another and even more important reason why the character and amount of food ingested during pregnancy must be carefully regulated. The strain to which the kidneys are subjected during pregnancy has already been mentioned several times, and an excess of food, especially if it is of an unsuitable kind, adds to this strain materially. If, then, this inordinate indulgence at the table and between meals is allowed to continue, the time may, and often does, come when some extra excess will serve to "break the camel's back" and throw the patient into a condition of eclampsia. Hirst mentions an instance of this kind, when a hearty Thanksgiving dinner was enough to bring on uræmic convulsions in an apparently healthy pregnant woman, with the result that the child was lost and the life of the mother saved only after most vigorous and prolonged treatment.

The exact cause of uræmic convulsions (eclampsia) during pregnancy is still a problematic question, and while many theories have been advanced in explanation of these phenomena, none has been accepted definitely by the entire medical profession.

One general statement may be made, however, and it is a sufficiently safe working theory for the nurse to keep in mind and regard at all times as a correct explanation of the cause of these convulsions. This is, that eclamptic convulsions are due to a storing up in the system of matter which should be eliminated either by the kidneys, the liver, or the digestive tract. It will be remembered that the mother has to eliminate not only her own waste products, but those of her infant as well, and that, at the same time, her organs of elimination are handicapped by pressure from the growing uterus and by the other disturbances in the general working of the bodily functions that always accompany pregnancy. This pressure and the accompanying disorders of nutrition increase as pregnancy advances,

and the danger of digestive disturbances grows greater from week to week. Even in the early months, when the pressure is slight and the functions of the emunctories have not been seriously affected, the diet must be carefully regulated to avoid a break-down when the strain is greatest.

No hard and fast diet-sheet can be laid down for the pregnant woman, and under ordinary circumstances, *beyond limiting the use of red meat to once a day,* she may be allowed to choose for herself so long as she selects only nutritious food of an easily digestible character. Red meat is limited, even in normal cases, because, being rich in nitrogenous matter, it is apt to cause sluggishness of the liver, intestinal fermentation, and indigestion, thus overtaxing all the organs of elimination and so tending to an accumulation of urea in the system.

This retention of *urea* in the blood gives rise to the condition known as *uræmia,* and, if not promptly recognized and treated, is productive of convulsions and, possibly, death. In untreated cases nature usually makes an effort to get rid of the products of fetal elimination, and so save the mother, either by the death or the expulsion of the child, but, as will readily be understood, it is extremely dangerous, not to say unscientific, to depend upon any such uncertain means of relief.

The occasional craving of pregnant women for unusual articles of food must be kept in mind, and any desires of this kind may be granted with safety when the articles demanded agree perfectly with the patient and are not of too exceptional a nature. Any marked perversion of appetite should, of course, be reported promptly to the physician.

While many patients will conscientiously follow directions expressed in a general way only, certain women will pay no attention to anything but the most explicit rules, and with such unruly cases the diet-sheet given below may be used to advantage. This list is, of course, only a general outline of the proper diet during gestation, for, as already stated, no absolute laws can be made to fit every case, and the likes and dislikes of the patient are never to be disregarded entirely. Food must be of such a character that the patient enjoys her meals thoroughly and gains regularly in weight and strength from day to day.

PROPER DIET DURING PREGNANCY.

Soups.—Any kind.

Fish.—Boiled or broiled fresh fish of any kind. Raw oysters and raw clams.

Meat.—Chicken, game, ham or bacon (broiled), tender lean mutton and lamb. All meats, more or less sparingly; and red meat is allowed only in perfectly normal cases, and then but once daily.

Farinaceous.—Hominy, oatmeal, wheaten grits, mush, rice, sago, tapioca, arrow-root, stale bread, Graham bread, rye bread, brown bread, corn bread, toast, milk toast, biscuits, macaroni.

Vegetables.—Potatoes, cabbage, onions, spinach, cauliflower, Brussels sprouts, asparagus, green corn, green peas, string beans, mushrooms, water-cress, lettuce or other salads with oil.

Desserts.—Plain puddings of rice, arrow-root, sago, or tapioca; custards, stewed fruits, ripe raw fruits, and ice-cream.

Drinks.—Plenty of pure water (hot, cold, or aërated), at least two quarts daily, milk, butter-milk, peptonized milk, kumyss, or zoolak. Very little tea, practically no coffee, and absolutely no alcoholic liquors unless specially ordered by the physician.

Such a list is susceptible to many additions and elaborations, but, in the absence of specific instructions from the physician, it will answer perfectly well to give to such patients as insist upon positive dietetic directions.

The bowels of the pregnant woman are to be watched carefully, and at least one satisfactory evacuation must be secured daily.

Constipation will probably be encountered, as nearly all women are more or less constipated, and this condition is usually greatly aggravated during pregnancy. For its relief the fluid extract of cascara sagrada may be ordered at bedtime, in doses of from one-half to one teaspoonful, or the official pill of aloin, strychnine, and belladonna may be given two or three times daily. In addition it is well to administer a gentle saline

laxative, such as the effervescent solution of citrate of magnesia, a Seidlitz powder, or Saratoga "Congress" water every third or fourth morning, before breakfast.

The dangers of constipation in causing an accumulation of excrementitious matter in the system have already been pointed out, as tending to the development of uræmia and eclamptic convulsions. Moreover, the mere mechanical effect of an overloaded bowel is to increase the pressure on the vital organs in a pelvis already filled to its utmost capacity.

Diarrhœa, on the other hand, is also a condition that cannot safely be neglected, for even if it is of simple origin and not due to any serious intestinal disturbance, it may, if allowed to continue, be enough to undermine the patient's strength to a dangerous degree. Prolonged or severe diarrhœa is often a direct cause of miscarriage as well, and any such condition of the intestinal tract which is not controlled promptly by simple home remedies, such as a draught of blackberry brandy, a dose of chalk mixture, or one of cholera mixture, should be reported to the physician without delay.

The NERVOUS CONDITION of the pregnant woman has already been referred to, and the nurse must do all in her power to make this trying period as pleasant and enjoyable as she can, both by her own efforts towards entertaining the patient and diverting her mind from subjects that annoy or irritate her, and by her advice and example to the members of the family as to the cause of any disagreeable traits that the woman may develop. It is, of course, not expected that the patient will fail to do her own share towards the preservation of harmony, and it is never a wise plan to bow submissively to her actions at all times, nor to allow her to think that merely because she is pregnant she is at liberty to be as exacting and unreasonable as she pleases. What is needed is the exhibition of a tactful restraint over her more exaggerated moods and a complacent disregard of trivial matters.

DURING THE LAST TWO MONTHS of pregnancy special attention must be paid to the *condition of the kidneys* and the *preparation of the breasts* for nursing.

A SPECIMEN OF URINE is to be sent to the physician's office once a week *without fail,* and oftener if he requires it. This should be from the *mixed urine of twenty-four hours,* and the bottle must be securely corked and clearly labelled with the total *quantity* of urine voided in the time mentioned, the patient's *name,* her *address,* and the *date.* This label should be pasted to the bottle and not written on the outside wrapper, which is often destroyed or mislaid as soon as it is removed. At least four ounces of urine should be sent, and the bottle should reach the physician in the early part of the forenoon, so that he can examine the specimen at his convenience.

The *breasts* must be prepared for nursing by careful attention to the condition and development of the nipples, for if the infant is unable to nurse, both it and its mother will suffer more or less.

The effect of stimulation of the breasts, by suckling, on the involution of the uterus has already been mentioned, and it will readily be understood that the infant will thrive better on breast milk than on any other kind of food.

The breasts should be bathed night and morning with soap and warm water, to keep the skin in the best possible condition, and after the bathing they are to be sponged briskly with water as cold as the patient can bear, to stimulate the activity of the glandular tissue.

It has been said that gentle massage of the breasts with lanolin once daily during the latter part of pregnancy will effectually prevent the formation of the silvery lines or striæ due to the distention of the skin (see page 56); and this, if it is true, will be greatly appreciated by those patients whose social duties require them to wear décolleté gowns. At any rate, it can do no harm and is well worth trying.

If the *nipples* are small, flattened, or depressed, they must be drawn out with the forefinger and thumb and held for five minutes night and morning throughout the entire two months preceding the labor. This will often develop them to a surprising degree, and nipples that at first seem absolutely unfitted for nursing can frequently be made sufficiently prominent by

this treatment to meet the needs of the child perfectly. The patient can, of course, do this herself after the nurse has instructed her in the proper method, but, as has been stated in a previous chapter, she must be cautioned as to the possibility of irritating the uterine muscle to contraction by too vigorous manipulation of the nipples, and warned to stop this treatment at once should any uncomfortable symptoms develop in the uterus or lower abdomen.

If there are erosions, fissures, or other diseased condition of the nipples, the physician should be consulted and will prescribe appropriate treatment.

All nipples, no matter how well developed and healthy they may be, are to be anointed every night with white vaseline or albolene, which is to be carefully removed in the morning with castile soap and warm water. This is to soften and remove the colostrum which the breasts secrete during the latter part of pregnancy, and which, if undisturbed, will form hard crusts on the nipples and excoriate the delicate tissues beneath.

Nipples which are not treated in this way and upon which crusts of colostrum are allowed to remain are often extremely sensitive or even exquisitely painful when nursing is begun, and are especially liable to the formation of erosions or fissures which may prevent nursing entirely, either because of the suffering caused by the suckling or by the development of inflammation in the breast itself.

As a general rule for the guidance of the nurse *in the management of pregnancy it is safest and wisest to report to the physician* any *condition that causes the patient special discomfort or that seems to be at all unusual.*

X

The Nurse's Outfit

THE care of obstetric cases presents so many differences from ordinary surgical nursing that the nurse requires a few special articles for this work in addition to her usual outfit.

In the first place she should provide herself with an *abundant supply of dresses and aprons,* for the nature of her duties are

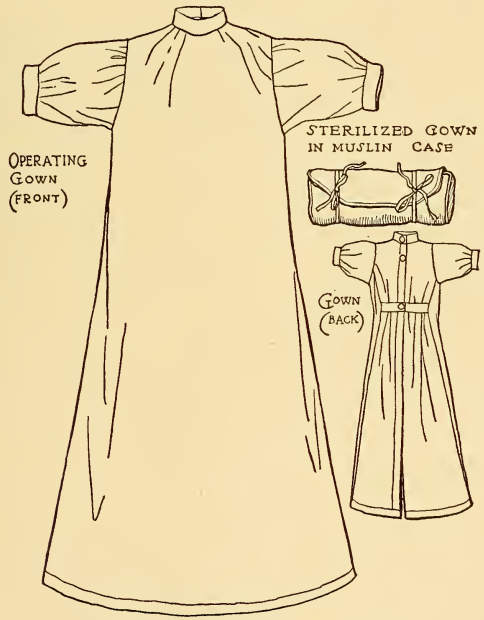


FIG. 38.—Operating gown and case.

such that, even with the utmost care, she cannot always prevent frequent soiling of her aprons at least. In addition to her white aprons she should have one large *rubber apron* for use when she is bathing the baby.

An *operating-gown* (Fig. 38), pinned in a towel or tied up in a muslin case, and sterilized, should be taken for use at the time of the delivery. Nurses often come to a case several days before the labor occurs, and, while wearing their uniforms, they are up- and down-stairs and in all parts of the house. Also, as will be seen in another chapter, the patient receives an enema at the beginning of labor, and frequent trips to the bath-room have to be made by the nurse on this account. Keeping these various matters in mind, it is evident that the nurse's uniform is anything but aseptic when labor is in progress, and the gown should be worn from the time the patient takes to her bed until after the placenta is delivered.

The nurses's arms should be bare to the elbows throughout the entire labor, and afterwards several times each day while she is attending to the toilet of the patient or bathing the baby. Frequent rolling up of the sleeves for this purpose soon rumples them to such an extent that they present a very disordered appearance, highly at variance with the picture of immaculate neatness which is always expected of a nurse. This difficulty may be obviated entirely by the use of "elbow sleeves" or by having *special dress-waists* made with sleeves that can be unbuttoned or unhooked just above the elbow and removed whenever necessary (Fig. 39). A little ingenuity on the part of the dressmaker is all that is necessary in designing an attractive and perfectly practical garment of this kind, and its convenience will be appreciated as soon as it is used.

Two thermometers should be taken to each case,—one for the mother's temperature and the other, a rectal thermometer, for the infant. There should be *temperature charts* for both mother and child in addition to the usual blanks for bedside notes. Temperature should always be charted, for its entire course can then be understood at a glance, while if it is recorded in any other way its significance is not always readily grasped, and unless the notes are studied with great care a single, isolated rise of temperature may escape the notice of the physician.

The infant is to be weighed at birth, and afterwards once

FIG. 39.—Proper costume for obstetrical nurse, showing detachable sleeves.

daily, and as scales are seldom to be had when they are wanted for this purpose, it is a good plan for the nurse to add to her obstetrics outfit a *small scales and hammock,* such as is shown

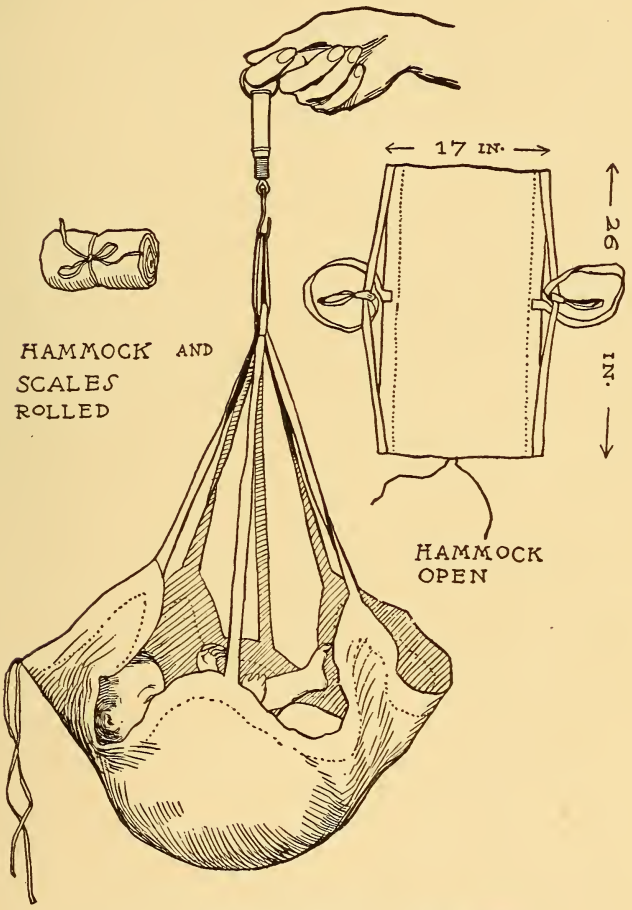


FIG. 40.—Scales and hammock for weighing infant.

in Fig. 40. The best scales are large ones with weights, or the old-fashioned " steelyards," for no spring balance is exactly accurate; but in the absence of the bulky apparatus, the little pocket affair

shown in the illustration, and to be had of any dealer in surgical supplies, answers very well. The infant's *weight* should be recorded daily on a chart, and blanks for this purpose, having space for the infant's temperature and weight, the mother's temperature and pulse, and all the other required data of a maternity case, have been designed by the author.*

A *glass feeding-tube* is needed for administering fluids to the patient immediately after labor and before she is allowed to raise her head.

Tape for tying the umbilical cord is not mentioned in the list of supplies to be provided by the mother, because the physician usually includes it in his own outfit, but occasionally it is overlooked, and at times, as in cases of precipitate labor, the nurse will have to tie the cord before the arrival of the physician. For these reasons it is best for her to provide herself with suitable cord ligatures, and the best material for this purpose is ordinary linen bobbin tape, to be found at any dry-goods or notion shop.

The *hypodermic case* should contain tablets of *ergotin* in addition to the usual assortment of drugs.

To RECAPITULATE, the obstetric nurse needs, in addition to the ordinary supplies that she would take to any case,—

Extra aprons.
Extra dresses, preferably with detachable sleeves.
One rubber apron.
One operating-gown, sterilized.
Two thermometers; one for mouth, the other for rectum.
Temperature charts.
Scales for weighing the infant.
Weight charts.
Glass feeding-tube.
Linen bobbin tape, for tying the umbilical cord.
Hypodermic tablets of ergotin.

---

* These charts are made up in pads, of fifty each and sold by C. C. Hine's Sons Co., 100 William street, New York City, who will send samples and quote prices on request.

XI

The Patient's Outfit

BEGINNING at a sufficiently early date in pregnancy to enable her to have all her preparations made at least one month before labor is expected to occur, the prospective mother should make ready the articles which will be required at the time of her confinement.

This outfit may be divided into two parts; one consisting of the articles needed for the mother's use, and the other of the supplies which will be required by the infant.

In many cases the physician will give the patient a list of the supplies he wishes her to get, but where the matter is left in the hands of the nurse the following outfit will usually prove satisfactory:

A. FOR THE MOTHER.

SIX ABDOMINAL BINDERS, one and three-quarters yards long by three-quarters yard wide; made of the cheapest grade of unbleached muslin. This muslin comes in a width of three-quarters yard, and ten and one-half yards are required to make the necessary number of binders. They should be torn in the proper length and then washed and ironed, to make them soft and comfortable. The cheapest grade of muslin is recommended because the more expensive, and consequently heavier, quality does not take the pins as well and is stiff and uncomfortable when in use.

TWO OBSTETRICAL PADS for the bed, each twenty-four inches square and made of cheese-cloth stuffed with cotton batting (not absorbent cotton) until it is three or four inches thick. They should be "tacked" or tufted to keep the cotton from slipping, and are for use under the patient's buttocks during the first few hours after labor when the flow is greatest. When prac-

ticable, it is well to have them sterilized before use; but this is not absolutely necessary if, as should always be the case, they are made with surgically clean hands from new material.

THIRTY SANITARY OR VULVA PADS. These are made of absorbent cotton, ten by three inches, and two inches thick, and covered with bleached cheese-cloth or plain absorbent gauze, which is really the same thing with the sizing washed out. They must be made of absolutely new and fresh material, with surgically clean hands, and, if possible, they should be sterilized before use. As soon as they are made they are to be done up in packages of six, and each package wrapped separately in a clean towel or in clean white muslin and laid away in a convenient place, free from dust, until they are wanted. They are used during the puerperium to place over the vulva to receive and absorb the lochial discharge, and are to be changed as often as they become soiled. Soiled pads must be removed at once from the room and burned.

ONE DOZEN CLEAN TOWELS, preferably old soft ones without fringe. These are to be pinned up in another towel and laid away with the other things. They are for use only about the patient, and are not for the hands of the physician or nurse. If a sterilizer is available they should be sterilized, but this is not indispensable if they were thoroughly boiled at their last washing.

NEW diapers may be used in place of the towels if desired, but old ones may never be employed for this purpose.

SAFETY-PINS. Two papers of large and one of small size, in addition to those required for preparing the bed.

ONE NEW NAIL-BRUSH for the nurse. The physician should bring his own. The best for this purpose are those with plain wooden backs, costing five or ten cents each.

ABSORBENT COTTON. Half-pound. Johnson & Johnson's is the best. This amount of cotton will not last throughout the entire puerperium, but it will be enough for the first few hours immediately following the labor, and more can be bought from time to time as it is needed.

TINCTURE OF GREEN SOAP. Four ounces.

Alcohol (ninety-five per cent.). One pint. For dressing the umbilical cord and for bathing purposes.

Two pieces of rubber sheeting, each one and one-half yards square. Of this sheeting one piece may as well be of the so-called "enamel-cloth" (white) which is often used for covering kitchen table and shelves and is much less expensive. This piece may be used for covering the cot or couch upon which the patient is delivered, and, afterward, cut into smaller pieces for the baby's bed or bassinette. The other piece, of the regular quality to be had of the druggist, is for use on the patient's bed during the puerperium and, later, by the baby, who will require it for the following three or four years.

Two wash-basins, preferably of agate or enamel-ware. These will be needed for solutions at the time of the labor; afterwards for bathing the patient's genitals during the puerperium; and still later for use about the infant.

One slop-jar or pail, made perfectly clean and used during labor for receiving soiled sponges, towels, and the like, as well as any solutions or discharges that can be directed into it.

A good supply of clean towels (in addition to the dozen already mentioned), and plenty of sheets, pillow-cases, and night-gowns for the patient's use. Nothing is more annoying to the physician than to call for a clean sheet or night-gown at such a time, and find that it is not to be had; while clean towels, almost without number, are needed in the lying-in room.

B. FOR THE INFANT.

Olive oil. Six ounces. For anointing the infant immediately after birth and before it is washed. A good grade of salad oil answers every purpose.

This practice of anointing the infant with olive oil, instead of washing it immediately after birth, is of the utmost importance, for it must be remembered that the temperature of the interior of the uterus is not far from 100° F., while that of the average lying-in room is seldom above 80° F.; a drop of 20 degrees. A child that is bathed with soap and water as soon as it is born runs great risk of "catching cold."

Solution boric acid. Six ounces. For cleansing the infant's eyes and mouth immediately after the head is born.

One tube plain white vaseline.

One cake of white castile soap.

Six flannel binders, six inches wide by twenty-two inches long. Forty-cent flannel, or better if desired.

One soft flannel blanket, one yard square, to wrap the infant in immediately after birth. Any old soft piece of woollen goods, such as an old flannel petticoat, will answer, but it must be scrupulously clean.

Four dozen diapers of linen or cotton diaper cloth. The cotton cloth is just as good as the linen and is less expensive. Not less than four dozen should be provided, and it is a great convenience to have at least one or two dozen more. Diapers should be cut so that their length is exactly double their width. They are folded once into a square and a second time into a triangle. During the first few weeks of the baby's life the diaper must be folded a third time into a smaller triangle or it will be too large. Diaper cloth comes in various widths, and it is well to get part of the smaller and part of the largest size.

One infant's bath-tub. The baby will not be bathed in the tub until after the umbilicus is healed, but it may be required at the time of the confinement for resuscitating an asphyxiated infant by immersion in hot water.

One bath thermometer. The temperature of the infant's bath should never be "guessed at" by the nurse.

One box of talcum powder.

Two powder-boxes and puffs of different appearance, one for the buttocks and body and the other for the neck and ears.

One small nail-scissors.

One soft infant's hair-brush.

A supply of small squares of absorbent gauze or clean old linen, for washing the infant's mouth, eyes, and ears, and to be destroyed after use.

Two soft sponges of different size, one for the buttocks and one for the body.

Six soft wash-cloths for the face and neck.

Two large soft bath-towels to wrap the child in after its bath.

It will be seen that many of the above-named articles can be improvised from material already on hand.

Four undershirts of stockinet, or silk and wool.

Four petticoats of flannel.

Four night-gowns of stockinet or flannel, according to the season of the year.

Ten slips, the more simply made the better.

The garments should all be made to open in the back, so that they may be fitted together and into the slip or dress, and all the clothing put on at once. (See Chapter XXII.) This style of garments may be purchased ready-made under the name of the "Gertrude Garments for Infants."

The above outfit of clothing is the smallest possible allowance with which the child can be kept clean and comfortable, and it would not be an extravagance to double the number of undergarments given.

The various articles for the mother and infant are to be laid away in a convenient place where they will be readily accessible to either the physician or nurse, preferably in bureau drawers which have been emptied and cleaned for their reception.

The nurse should assure herself that everything is ready and in its place at least three weeks before the expected date of the labor, for nothing is more annoying to the physician than confusion and delay after labor has begun. Moreover, if the proper supplies are not at hand when they are wanted, and any emergency arises, it is impossible to manage the case in an aseptic manner, and the health, if not the life, of the patient may be greatly endangered.

All the articles mentioned above can be prepared by the patient or nurse, but many persons prefer to buy the necessary supplies and dressings, and there is a variety of "maternity outfits" on the market ranging in price from $3.00 to $50.00.

The outfit described here, but without the bulky articles, is made up by Johnson & Johnson, of New Brunswick, New Jersey, under the name of the "Cooke Maternity Outfit," and may be

ordered through any druggist or dealer in surgical supplies. It contains:

Six abdominal binders, one and three-quarters by three-quarters yards.

Two obstetrical pads.

Twenty-four sanitary pads.

Three papers safety-pins, assorted sizes.

One nail-brush.

One tube vaseline.

Two packages absorbent cotton.

One bottle synol soap.

One bottle alcohol (ninety-five per cent.).

One bottle olive oil.

One bottle solution of boric acid.

One bottle bichloride tablets, for making solutions.

Tape for tying the umbilical cord.

Wipes for cleansing the infant's eyes and mouth.

One cake castile soap.

One box talcum powder.

Two sponges for the infant, larger for the body, smaller for the face and neck.

XII

The Mechanism of Labor

In studying the mechanical phenomena that accompany delivery it is necessary to consider three factors,—the *"passenger"* (fœtus); the *"passages"* (uterus, vagina, and vulva); and the *forces of labor,* which impel the "passenger" through the "passages" into the world. The forces of labor may be subdivided into two classes,—the *expulsive forces,* situated in the muscular fibres of the uterus and assisted by the powerful abdominal muscles; and the *resistant forces,* which consist of the resistant powers of the tissues composing the cervix, the vaginal floor, and the perineum.

These two classes of forces must be very nearly balanced, but with the expulsive force *slightly in excess,* if the labor is to be normal. If the resistant forces are in excess, labor cannot occur without operative interference, and if the expulsive force greatly exceeds the resistant force a precipitate labor will result, with probable severe laceration of the maternal soft parts and with great danger to both mother and child.

The "passenger" (fœtus) lies in the womb in a state of complete flexion, and we have to consider its *presentation* and its *position,* for unless these are both normal, or can be made normal, the labor cannot be normal.

Presentation refers to that part of the fœtus which "presents" at the brim of the pelvis at the beginning of labor. For example, if the head lies in the brim ready to come down into the vagina the case is said to be one of "vertex" presentation; while if the breech is first to appear, it is called "breech" presentation.

Position has to do with the relation of the presenting part to the pelvis. Thus, in a vertex presentation, the back of the head (occiput) may point to the front or to the back of the

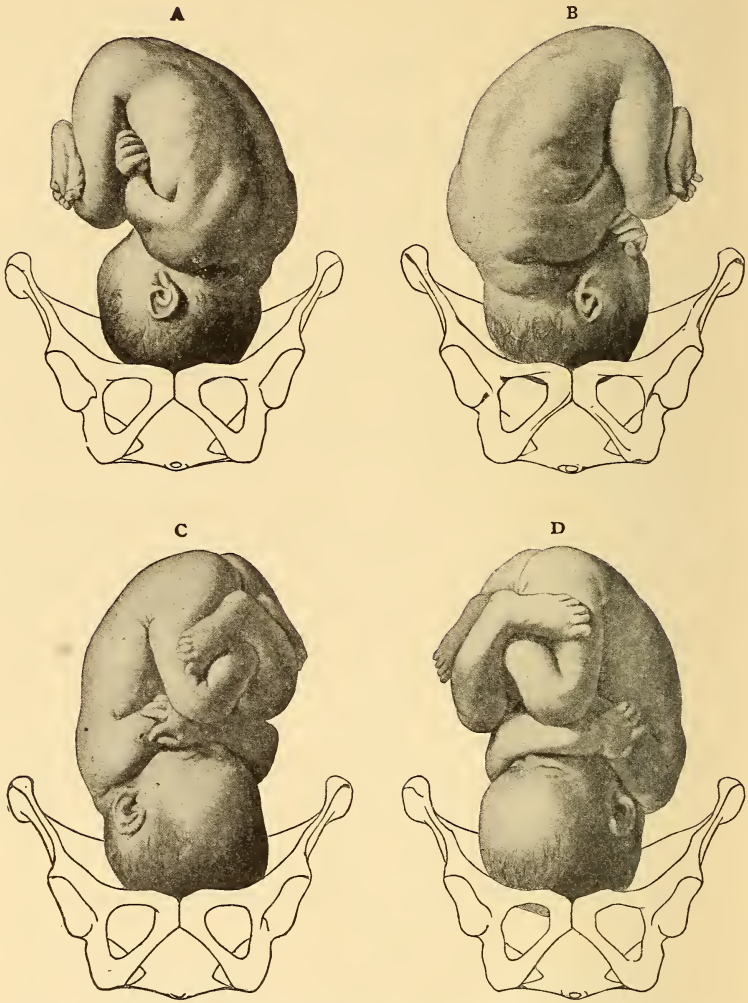


FIG. 41.—Vertex presentation. (Bumm.) A, left occipito-anterior (L. O. A.); B, right occipito-anterior (R. O. A.); C, right occipito-posterior (R. O. P.); D, left occipito-posterior (L. O. P.).

pelvis. The occiput never points exactly forward or backward in the median line, but is always directed to one side or the other of the middle. Consequently we may have any one of four positions in a vertex presentation,—namely:

Occiput to left of front, or left occipito-anterior. ("L. O. A.")

Occiput to right of front, or right occipito-anterior. ("R. O. A.")

Occiput to right of back, or right occipito-posterior. ("R. O. P.")

Occiput to left of back, or left occipito-posterior. ("L. O. P.")

Vertex presentations (Fig. 41) occur in nearly all cases (ninety-seven per cent.), probably because the head is the heaviest part of the fœtus, and so has a natural tendency to sink to the bottom of the uterus. The position of more than half (seventy per cent.) of all vertex presentations is with the occiput to the front and to the left of the median line. This is called the "left occipito-anterior" position of the vertex, and is usually abbreviated by physicians as "L. O. A.," an expression with which the nurse will become very familiar in the course of her obstetrical training. "L. O. A." is by far the most common of all positions, and as, for this reason, it may be regarded as the normal position of the fœtus in utero it is also occasionally styled the "first" position.

In the same way, the other positions of the vertex, "R. O. A.," "R. O. P.," and "L. O. P.," are sometimes called, respectively, the second, third, and fourth positions of the vertex.

In order that the vertex, or top of the head, may present, the head must be *"flexed;"* that is, tipped forward on the chest; and this flexion increases as labor progresses until the head has passed through the brim of the pelvis and is in the vagina (Fig. 42).

While the head is descending in this way the occiput is gradually rotated forward (in anterior cases) until it lies in the median line in front and under the symphysis pubis. This rotation is due to the action of the funnel-shaped walls or *"inclined*

planes" of the pelvis, which turn the head in the right direction much as a ball may be rolled down a winding gutter or trough.

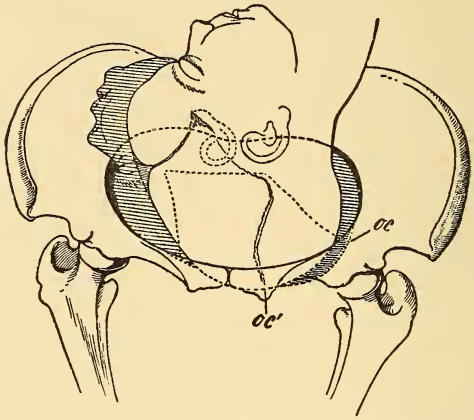


FIG. 42.—Flexion of head during second stage. (Pinard and Varnier.) The shaded head shows the minor flexion at the beginning of labor, and the unshaded the stronger flexion as labor progresses. *oc*, *oc'*, occiput.

As soon as the completely flexed head has passed through the pelvic brim and lies with the occiput under the symphysis, the process of *"extension"* begins. The chin is now raised from the infant's chest and sweeps down over the posterior vaginal wall and perineum into the world (Fig. 43). The occiput, which has been practically stationary under the symphysis, where it has acted as a pivot during the extension of the head, is now born, and the most difficult part of the labor is over.

Almost immediately after the birth of the head it is again rotated in a quarter-circle, so that its back points to the same side that it did at the beginning of labor. This is called *"external rotation,"* or *"restitution"* (Fig. 44), and is caused by the action of the inclined planes of the pelvis on the *shoulders* of the infant, which are rotated like the head as they pass down through the pelvic canal. "External rotation" is of interest to the physician, as it enables him to verify his diagnosis of position, made at the beginning of labor. If the case is "L. O. A.,"

the back of the head will, after external rotation, point to the left side of the mother, as it did before labor began.

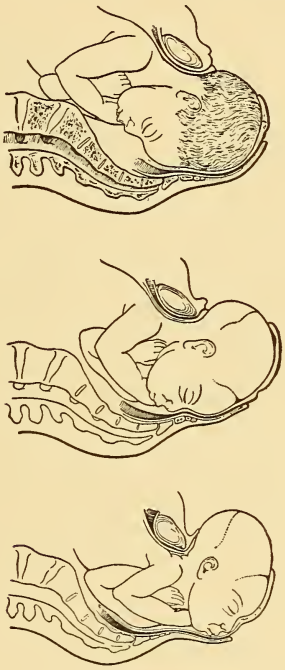


FIG. 43.—Extension of the head in anterior presentations of the vertex. (Garrigues.)

We have, then, to consider during labor in *anterior* positions of the vertex ("L. O. A." and "R. O. A."), Flexion, Rotation, Extension, and Restitution of the head, all accompanied by Descent (Fig. 45).

If, instead of being *flexed,* the head, in a vertex case, is *extended* or tipped backward on the body of the child at the beginning of labor, the case will become one of *"face"* presentation. This is one of the most serious complications that can arise in connection with labor, for if the face cannot be changed by the physician into a vertex presentation, the child cannot be born, except in rare instances, without operative interference of one kind or another (Fig. 46).

"*Brow*" presentations are those midway between face and vertex, and occur when the head is neither fully flexed nor fully

FIG. 44.—External rotation. (Garrigues.) The case was originally L. O. A., and the vertex now points to the *left* thigh of the mother.

extended (Fig. 47). Because of the "wobbly" position of the head, brow cases usually convert themselves into either face or vertex presentations before labor is very far advanced. Happily, the most common outcome of a brow case is spontaneous conversion into a vertex presentation.

Either a brow or face presentation may occur in any one of four positions, named according to the direction in which the chin points (Fig. 48).

BREECH PRESENTATIONS are those in which the breech instead of the vertex presents at the pelvic brim. They are fairly com-

mon, and the chief difficulty in their management lies in the fact that, during the descent of the body, the arms of the fœtus are liable to become extended above the head and interfere

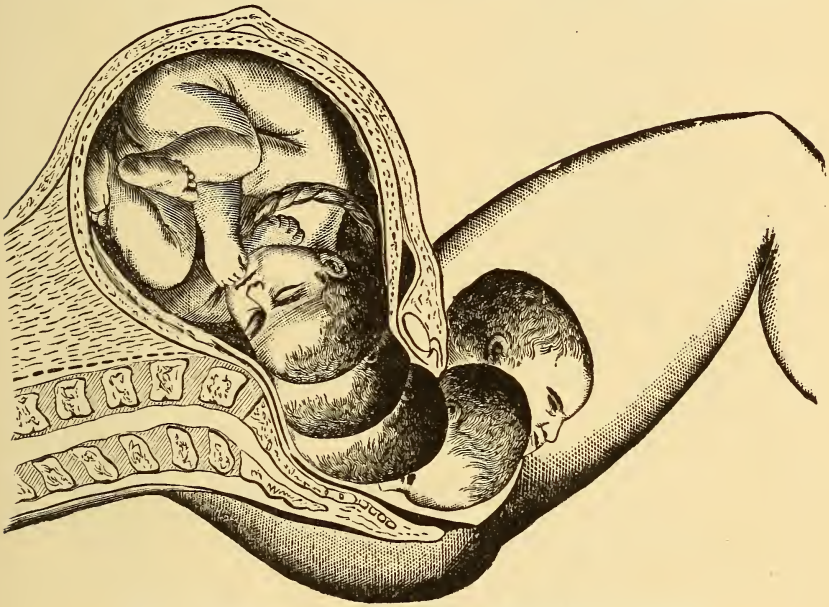


FIG. 45.—Internal rotation and extension. (Tarnier and Chantreuil.)

seriously with its passage through the pelvis (see Fig. 69). Breech presentations occur in any one of four positions, named according to the direction in which the sacrum of the infant points (Fig. 49), thus:

Left sacro-anterior ("L. S. A.")
Right sacro-anterior ("R. S. A.")
Right sacro-posterior ("R. S. P.")
Left sacro-posterior ("L. S. P.")

In breech cases the infant often passes *meconium* from its rectum during the course of the labor, and if, after the membranes are ruptured and the liquor amnii has escaped, the nurse finds a black, tarry discharge coming from the patient's vagina, she may very properly suppose that the case is one of breech presentation.

FIG. 46.—Shape of head of child born in face presentation. (Charpentier.)

FIG. 47.—Shape of head of child born in brow presentation. (Charpentier.)

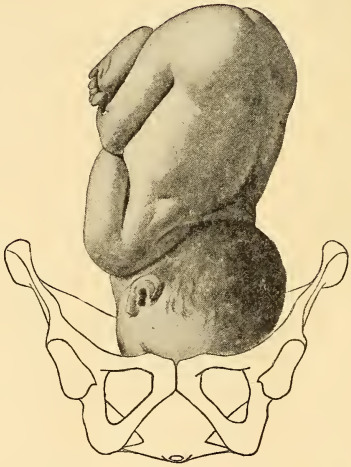


FIG. 48.—Face presentation. (Bumm.)

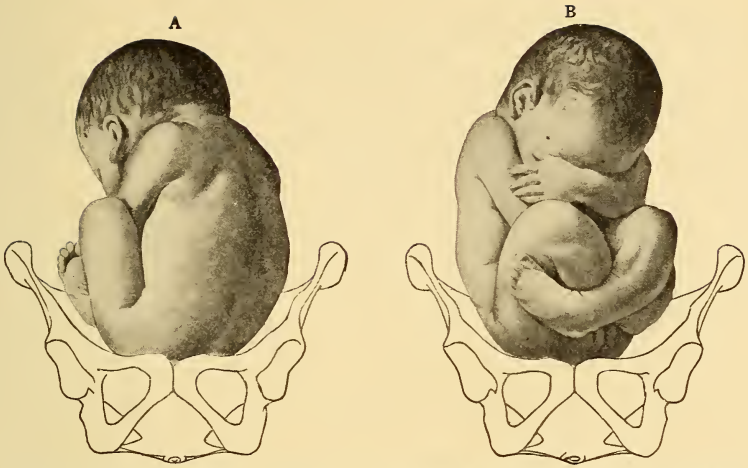


FIG. 49.—Breech presentation. (Bumm.) A left sacro-anterior; B right sacro-posterior

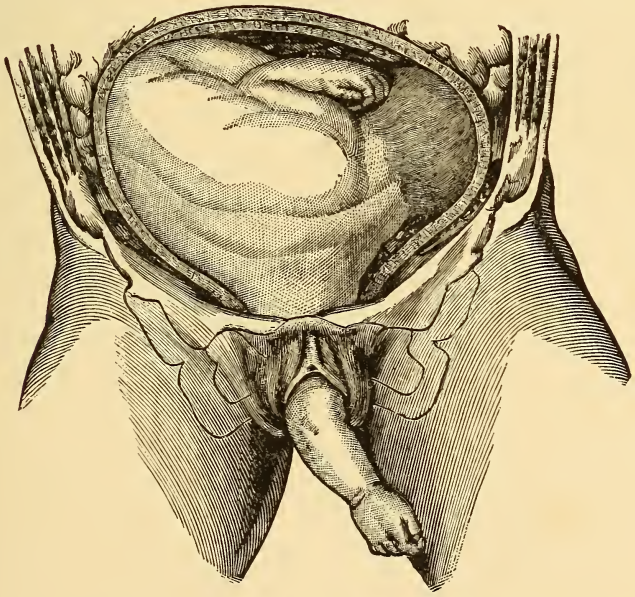


FIG. 50.—Prolapse of arm in transverse presentation. (Tarnier and Chantreuil.)

Other presentations, all of which are very rare, are those of the foot, arm (Fig. 50), or shoulder.

The study of the special mechanism of the different presentations and positions is one of great interest, but the brief outline given of the mechanism in anterior positions of the occiput is all that directly concerns the nurse.

All other cases are more or less abnormal, and, as their progress is usually slow, their management must be left entirely in the hands of the medical attendant.

XIII

The Phenomena of Labor

Labor occurs at the end of pregnancy, and is also known by the various names of *"delivery," "confinement," "lying-in,"* and *"parturition."*

The usual *time* for labor to take place is two hundred and eighty days (ten lunar months, or nine calendar months) after the occurrence of conception. This period varies somewhat, and it is possible for a child to be born and live after only about two hundred and twenty days of utero-gestation. These cases are, of course, extremely rare, and it goes without saying that the more nearly the pregnancy reaches its normal duration the better will be the development of the child and the better its chances for living. The only exceptions to this rule are in cases where the mother is suffering from a disease that greatly imperils the life of the child, or where the child is very large or the pelvis very small, and the induction of premature labor exposes the infant to less risk than would a difficult operative delivery at full term.

The popular belief that a seven-months baby has better chances for life than one born at eight months is the most arrant nonsense. It probably arises from the fact that a child born at seven months is positively known to be premature, and so receives the most careful attention after birth, while an eight-months baby is so nearly a full-term infant that its prematurity is often overlooked and it receives no special attention, and may die from some inadvertent neglect of small but important details. After it is dead the fact that it was one month premature is brought out and commented upon.

In other cases the pregnancy may exceed its usual duration of two hundred and eighty days, but probably it never goes more than three weeks over term under any circumstances, and three hundred days may be regarded as the extreme limit. In France this point has been made a matter of legislation, and an infant

born at any time within three hundred days after the death of its mother's husband is regarded by law as legitimate and entitled to property rights in the father's estate, while one born even twenty-four hours after this period is deprived of the right of inheritance.

The method of calculating the *probable* date of labor is mentioned in another chapter, but it may also be referred to here.

Count back three months from the first day of the last menstruation, and add seven days. This will give a date to be regarded as the middle of a period of two weeks during which the labor may be expected to occur. Thus, if the woman's last menstruation began September 9, count back three months, to June 9; add seven days, making June 16, and tell her that she will probably be confined some time between June 9 and June 23, of which period June 16 is the middle. Of course, this method is approximate at best, and when menstruation has continued in the early months of pregnancy it has no value whatever. Under such circumstances the probable date of the labor will have to be computed by the physician after a careful consideration of all the early signs of pregnancy.

THE CAUSE OF LABOR is probably due to the fact that at the end of pregnancy the uterus is stretched to its greatest possible extent, while the fœtus continues to grow larger. The muscular fibres of the uterus resent this over-distention and put an end to it by contracting and forcing the fœtus out of the womb. This theory is borne out by the fact that in twin pregnancies, or in other cases where the uterine contents is unusually large, premature labor is very likely to occur, showing that when a certain degree of distention is reached labor will begin.

THE PREMONITORY SYMPTOMS OF LABOR are usually well marked in the case of a first pregnancy, but in some instances, and especially with women who have borne children, they may be entirely absent. When they do occur they may begin at any time up to two, or even three, weeks before the actual onset of labor. They are due chiefly to the sinking down of the uterus into the pelvis preparatory to the engagement of the fetal head in the pelvic brim. This relieves the pressure on the diaphragm

and so lessens or stops the cough, dyspnœa, and other unpleasant symptoms of the last weeks. While the sinking of the uterus relieves the pressure above the diaphragm, it increases that on the pelvic viscera, causing constipation and irritability of the bladder. On the whole, however, the woman feels more comfortable than she did before the sinking of the womb. In addition to the symptoms due to alterations in pressure there are occasional slight uterine contractions occurring at irregular intervals and causing the woman no discomfort beyond the sensation of faint and indefinite cramp-like pains in the abdomen.

Labor is divided, for convenience of description, into *three* distinct stages.

The FIRST stage begins with the first true labor-pain and ends with the complete dilatation of the os uteri.

The SECOND stage begins with the end of the first and ends with the birth of the child.

The THIRD stage begins with the end of the second and ends with the delivery of the placenta and membranes.

In normal cases the first stage is longer than the second and third together, for after the os is fully dilated the labor progresses rapidly.

LABOR-PAINS are merely the contractions of the uterine muscle, and are called "pains" because of the suffering that accompanies them. The incorrectness of the term is evident when one occasionally hears a woman say, "I always have easy labors; my *pains* never hurt me at all."

THE PHENOMENA OF THE FIRST STAGE.—The pains are short, slight, and separated by long intervals, usually about half an hour. They do not cause the patient any particular discomfort, and are not accompanied by any straining of the abdominal muscles. What little pain there is is located in the back, and the patient is usually on her feet and walking about. If the woman has never borne a child or seen a labor, she is commonly in rather a jocular frame of mind, and often expresses great contempt for the reputed suffering of child-birth.

A little later, however, the entire picture changes. The pains last longer and are more severe, and recur at more frequent

intervals. The patient is still walking about, but at the beginning of each pain she grasps a chair-back or some other piece of furniture, and, leaning heavily against it, "grunts" audibly when the pain is at its height. Even now the pains are not specially severe, and between them the patient is usually cheerful and still of the belief that labor is not such a terrible thing after all. As the hours go by the pains become more and more frequent, until they are only five or six minutes apart, while at the same time they last longer and are more severe. The patient is now tired and fretful, and begins to complain bitterly that the end will never come and that something must be done to relieve her. Her entire disposition changes and her face bears an expression of anxiety and dread. She may be nauseated, or even vomit, and her bowels and bladder are emptied every few minutes. At the acme of each pain she usually moans slightly, and in the intervals she says little, except to ask for water or other attention and complain of the slow progress she is making.

This picture indicates that dilatation of the os uteri is nearly, if not entirely, complete, and the nausea and vomiting are favorable symptoms, for they are accompanied by relaxation of the tissues.

At or about this time the amniotic sac, which, from the beginning of labor, has been forcing its way down through the os and dilating it in every direction, usually ruptures and the fluid escapes with an audible gush.

Even without a vaginal examination it is usually easy to tell from the appearance of the patient that the first stage of labor is at an end. It may have lasted anywhere from one to twenty-four hours, and is always protracted if the membranes rupture before dilatation of the os is complete.

The Phenomena of the Second Stage.—The patient is now in bed and the pains are severe, long (fifty to one hundred seconds), and occur at intervals of every two or three minutes.

The abdominal muscles are now brought into play, and as a pain occurs the woman "bears down" with all her strength, so that her face becomes red and even cyanotic, and the large vessels in her swollen neck pulsate violently. At the beginning of a pain

she begins to mumble fretfully, and as it reaches its height she concentrates all her voice into a peculiar frenzied cry, so characteristic of labor that one who has ever heard it would recognize it at once, even amid the most improbable surroundings.

With it all, however, the woman does not complain as much now as during the first stage, and, instead of plying the nurse and physician with impatient demands for relief, she devotes her entire energy to delivering herself, and at times seems almost oblivious of her surroundings.

Towards the end of the second stage, when the head is well down in the vagina, its pressure often causes small particles of fecal matter to be expelled from the rectum at the occurrence of every pain.

The pains are now occurring so rapidly that there is scarcely any interval between them, and finally, with a sharp, agonized shriek, the head is born and the mother lies gasping for breath and sighing contentedly. One or two more pains are enough to effect the birth of the body, and practically all of the labor is over.

The Phenomena of the Third Stage.—Towards the end of the second stage the placenta has become detached from the uterine wall and lies loosely in the womb or partly in the vagina. After the birth of the child the uterus contracts firmly on the placenta, and there is a period of from ten to thirty minutes in which no pains occur and the exhausted muscles rest from their exertions. A little blood trickles from the vagina, and finally, with one short and not very severe pain, the placenta and membranes are expelled and the uterus contracts firmly and permanently.

The total duration of labor in normal cases averages about ten hours, the greater part of which time is taken up by the first stage; but the time may vary from one or two to even twenty-four hours without being in any way injurious to the patient.

XIV

Preparations for Labor

THESE begin with the making or purchase of the supplies described in Chapter XI. and end with the selection, furnishing, and preparation of the lying-in room.

The ROOM in which the confinement is to take place is to be chosen with great care, for it must serve first in the capacity of a hospital operating-room and afterwards meet the requirements of a cheerful and comfortable bedchamber, in which every want of a convalescent patient can be met promptly and satisfactorily. For these reasons there are two prime factors in the choice of the room which can never be safely overlooked. First, it must be scrupulously and surgically clean; and second, it must be bright, spacious, properly lighted, well heated, and thoroughly ventilated.

The nurse is, of course, limited in her selection of a room for this purpose to the possibilities of the house in which the patient resides, but no room is too good for the business in hand, and she is at perfect liberty to make use of even the parlor or dining-room if it seems best suited to her needs. Naturally, the nurse will avoid putting the family to any unnecessary inconvenience, but her first thought must always be in the interest of her patient.

The *ideal lying-in room* is one that is large, sunny, provided with an open fire-place, and with a well-equipped bath-room adjoining, or at least on the same floor. It should be situated in a part of the house that is quiet and as far as possible from the odors of the kitchen and other unpleasant features.

The nurse must make sure that the room has not been occupied within at least six months by a patient suffering from any contagious, infectious, or suppurative disease, and if such is found to have been the case the room is to be condemned and another, though possibly a less convenient one, chosen in its place. If, for any reason, it is impossible to make use of another

room, the infected one is to be thoroughly disinfected with formalin * and then entirely dismantled, and repainted and repapered throughout.

In any event, the lying-in room is to be thoroughly cleaned and all the wood-work wiped off with damp cloths at least two weeks before the expected date of the labor; and all curtains, draperies, portières, and other articles that can collect dust are to be banished. In the same way, all unnecessary furniture is to be removed and only enough left to make the room comfortable and cheerful.

It is well to have the carpet taken up, especially if it is old or at all soiled, but in some cases this may be avoided by covering the floor with muslin sheeting, well tacked down to prevent its slipping; or even by having the carpet wiped off with Platt's Chlorides after it has been well swept. As an argument in favor of taking up the carpet, when objection is raised on the score of unnecessary inconvenience, the patient may be reminded that if this is done the carpet will be in no danger of damage from the possible spilling of blood or solutions.

In short, the room is to be as clean and free from dust-collecting and germ-breeding articles as it is possible to make it, and the nurse who has been thoroughly drilled in aseptic and antiseptic methods will understand what is required without further argument.

THE FURNITURE OF THE LYING-IN ROOM should consist of,—

A bed for the mother.

A bed for the nurse (unless she is to occupy another room).

A bed, or bassinette, for the infant.

A bureau, or chiffonier.

A strong but light table.

A wash-stand, properly equipped.

An extra slop-jar, or pail.

Two or three chairs.

---

* This can be done conveniently with "Lister's Formaldehyde Fumigators," manufactured by Johnson & Johnson, of New Brunswick, New Jersey.

It is undesirable to have running water in the room, because of possible danger from defective plumbing, and if, by chance, there is a stationary basin, the nurse should plug up the little holes of the overflow with corks or putty, and keep the bowl half full of water. If a bath-room or dressing-room adjoins the lying-in chamber, with a door between, it is a great convenience.

The infant should never, *under any circumstances,* be allowed to sleep with its mother, and its bed may be either the crib that it is to occupy during its childhood or a *bassinette* (Fig. 51), designed for use only in its infancy. In emergency cases, where neither of these is at hand, a temporary bed may be made for the baby out of a box, a large trunk-tray, or a bureau drawer; or it may sleep on a couch or in a large arm-chair. Two ordinary cane-seated chairs, placed against the wall and with a hair pillow or cushion for a mattress, make an excellent temporary bed.

Bassinettes may be purchased in any style and at any price that suit the taste and the pocket-book of the purchaser, or a very pretty one may be made at home with a clothes-basket as a basis and barrel-hoops wound with ribbon to support the draperies. As a rule, the chief objection to the bassinette is its great depth, and as an infant needs plenty of fresh air it is not benefited by spending the greater part of its time at the bottom of a deep basket, surrounded and entirely shut in by curtains and hangings. In selecting or designing a bassinette, the top of the infant's bed should never be more than four inches below the top of the basket or framework, and if the nurse finds one ready for use in which this depth is exceeded she should raise the level of the bed by placing under it a folded blanket or a pillow. The bed should be of hair and never of feathers, or the infant will sink down into it and be hot and uncomfortable from the first.

THE MOTHER'S BED should be the best that the house affords, for the period of convalescence after labor is the more trying to the patient the more nearly it is normal, and unless her bed is a comfortable one it is often a very difficult matter to persuade her to keep in it for the required number of days. The springs

FIG. 51.—Bassinette. (Davis.)

should be good and the mattress firm and solid so that it will sink down in the middle as little as possible.

Unless it is absolutely necessary this bed should never be the one in which the woman is confined, and for this purpose a cot or broad, flat couch is to be provided, which can afterwards serve as the bed for the nurse if no other is available. If the labor takes place in an ordinary double bed, it is extremely difficult for either the physician or the nurse to "get at" the patient conveniently, on account of its width and the presence of the head-board and foot-board; while if any operative work becomes necessary or an emergency arises, the awkwardness of the situation is more marked than ever. On the other hand, if a cot or couch is used, the patient is accessible from all sides, and the case can be managed as easily and conveniently as on a hospital operating-table. An acceptable, though by no means necessary, addition to the cot or couch is the use of two blocks of wood or two strong boxes on which it can stand, and which will raise it to the height of a table or hospital bed.

THE PREPARATION OF THE BED OR BEDS depends upon whether one or two are to be used. If but one bed is provided it must be so arranged that, after the labor, it can be rearranged quickly and easily and put into a clean and comfortable condition without disturbing the patient to any great extent. The best way to accomplish this is to first prepare the bed as it is to be during the puerperium and then add the necessary preparations for the labor.

The mattress is to be supported from below by means of boards slipped in between it and the springs, so that it will be perfecty firm and level during the labor and not sag down in the slightest degree. Boards may be made expressly for this purpose, or table-leaves or slats from another bed may be used. They are to lie crosswise of the bed, at a point directly under the patient's buttocks, and should be removed at the conclusion of labor. Their use facilitates all the work about the patient, and by keeping the mattress perfectly flat prevents the blood and other discharges from collecting in a pool under the patient's back.

The mattress is now to be covered with a piece of rubber sheeting pinned securely at the sides and corners so that it will

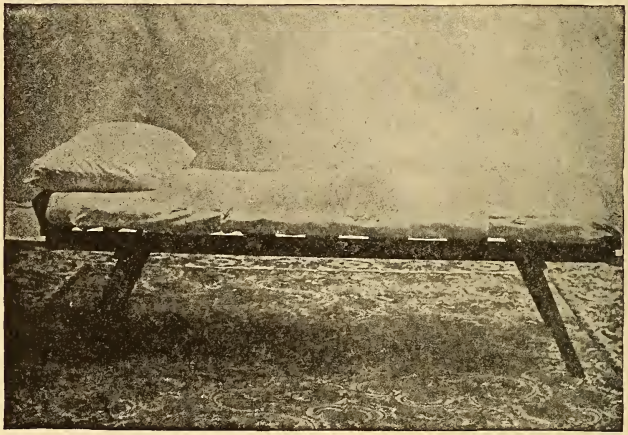


FIG. 52.—Preparation of bed for labor. First stage.

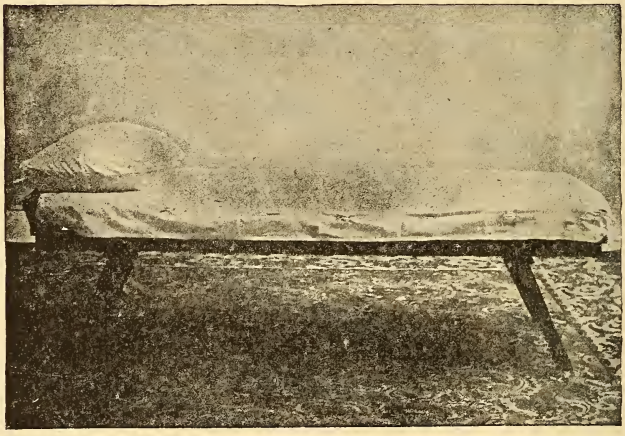


FIG. 53.—Preparation of bed for labor. Second stage.

not slip; over this is to be placed a white sheet pinned in the same way, and over this a draw-sheet, also carefully pinned

(Fig. 52). This is the correct arrangement of the sheets for the puerperium, and they must be protected for the labor by covering them with another rubber sheet or " enamel cloth " and white sheet, both of which are to be pinned securely all around (Fig. 53).

After the labor is over the uppermost white sheet and rubber sheet are removed, and the patient lies on the white sheet and draw-sheet underneath.

If two beds are used, the mattress of the cot on which the labor is to occur is supported with boards, as in the first instance, and protected with a rubber sheet covered with a white sheet, both of which are securely pinned on all sides.

The other bed is then made ready in the manner already described with rubber sheet, white sheet, and draw-sheet. On the draw-sheet should be placed one of the obstetrical pads from the maternity outfit, in such a position that it will come directly under the patient's buttocks when she is laid in the bed.

Unless the various coverings are carefully and securely pinned they will become greatly disordered by the tossing and turning of the patient, and in protracted cases they may even be torn entirely from the mattress and cast on the floor.

The nurse should see that the provisions for lighting the room at night are ample, and that it is warm and comfortable in every way.

Last Moments.—The physician should be summoned as soon as labor-pains begin, unless he has given definite instructions to the contrary. Some physicians prefer not to be called to a case until, in the opinion of the nurse, the first stage is nearly at an end, but even under these circumstances it is better that he should know that the woman is in labor, so that he will be prepared to respond promptly to the second call.

After the messenger has been despatched for the doctor the patient should be given *an enema of soapsuds, one pint, and spirits of turpentine, one teaspoonful.* This will effectually empty the lower bowel, and render the labor not only easier but infinitely more cleanly, *and must never be neglected.*

The patient should now receive a thorough general bath with

plenty of soap and warm water, either in the tub or, if the pains are severe, in the form of a sponge-bath. After the bath her hair is to be well brushed and braided in two braids, and she is to be dressed in a clean night-gown, clean stockings, and slippers, over which she will wear a wrapper or bath-robe that can be slipped off and on easily.

Some authorities object to the use of the tub-bath at the onset of labor, in the belief that there is danger of the entrance of unsterile water into the vaginal canal. This has always seemed an unnecessary precaution to the author, but the nurse should make it a point to learn the wishes of the attending physician in this matter and act in accordance with his views. If objection is made to the general bath the patient should be caused to stand in the tub, which is to be partly filled with warm water so that her feet will not be chilled, and then given a thorough sponge bath, after which she may be showered, either with a spray or with water poured over her from a pitcher.

While the patient is occupied with her bath the lying-in chamber is to be prepared for the labor, and the bed, or beds, properly made up. If the patient has been sleeping in the bed in which she is to be confined it is to be completely dismantled and supplied with clean bedding throughout. A chair is to be placed at the right side of the bed, facing the head, for the physician, and a table (preferably a low cutting-table) covered with clean white towels should stand within easy reach of his right hand. The slop-jar, or pail, is to be placed so that the apron of the physician's Kelly pad will drain into it (Fig. 54).

The patient's genitals should now be bathed with a solution of Tincture of green soap (two drachms to the pint) made with boiled water, and the vulva covered with a clean sanitary pad held in place by a band about the waist.

FROM THIS MOMENT THE USE OF THE WATER-CLOSET MUST BE FORBIDDEN ABSOLUTELY. Evacuations of urine and fæces are to be received in a clean vessel, which is to be removed at once from the room, emptied, cleaned thoroughly, and returned with as little delay as possible. The vulva pad, which must, of course,

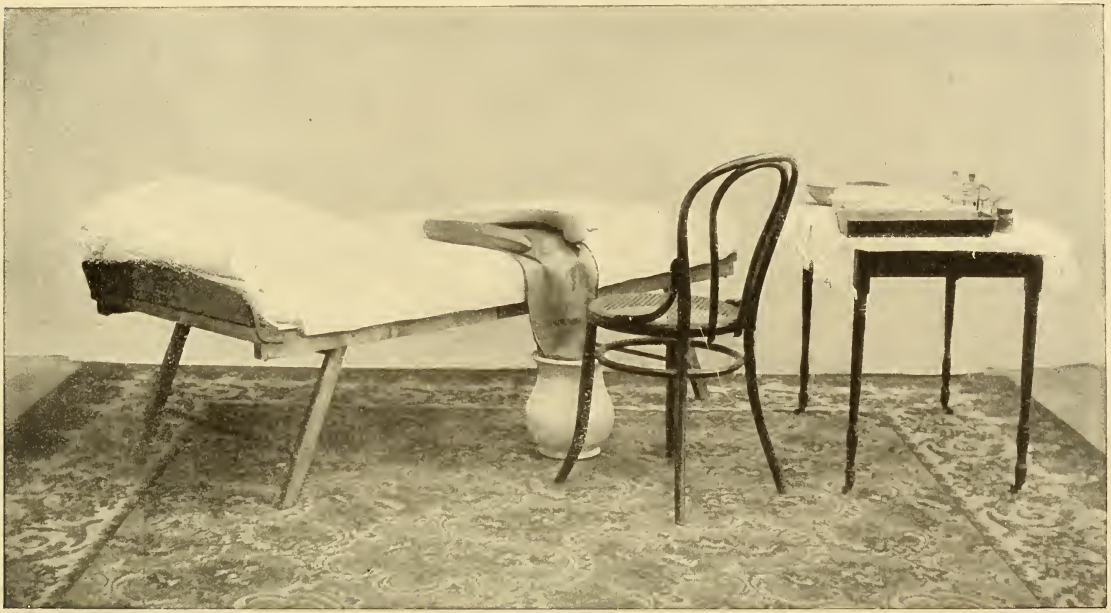


FIG. 54.—Arrangement of bed, table, and chair for normal labor.

be removed when the rectum or bladder is emptied, is in every instance to be replaced by a fresh, clean one.

The nurse should see that the lying-in room is warm, well lighted, and arranged according to directions; that all supplies are at hand and in order; that there is an ample supply of cold boiled water; that there is a good fire in the kitchen stove, unless a gas-stove is available, and that plenty of water is actually boiling; that the instructions relative to the patient have been conscientiously carried out; and, lastly, that all children and other unnecessary individuals have been gotten out of the way.

XV

The Conduct of Labor

Normal labor may be defined as labor which is terminated without artificial assistance and which leaves the mother in good condition, beyond a slight feeling of exhaustion and sense of fatigue. It might perhaps better be termed "unassisted labor," for surely an easy and rapid breech delivery, which occasionally occurs and which is in one sense to be regarded as a distinct abnormality, is to be preferred to a protracted and difficult vertex case which subjects the mother to great suffering and more or less shock.

For practical purposes, then, so far as the nurse is concerned, we may regard as normal any labor which is accomplished within a reasonable length of time without manual or instrumental interference.

In the cases most likely to come under the care of the trained nurse in private practice she will often be summoned several days or even weeks before the onset of labor, and so will be in a position to observe its phenomena from the very first.

It is assumed that all the preparations named in Chapter XIV. have been made, and that everything is in readiness for the expected event.

For a varying period before the establishment of true labor-pains the patient will often suffer from so-called "false pains," and the nurse must be able to distinguish between them and effective uterine contractions.

False pains may begin as early as three or four weeks before the termination of pregnancy, and they are merely exaggerations of the intermittent uterine contractions which occur throughout the entire period of gestation, combined with the effects of pressure on the abdominal tissues as the uterus and its contents settle down in the pelvis. They occur at decidedly irregular intervals, are confined chiefly to the lower part of the

front and sides of the abdomen and groin, never extending around to the back, and are short and ineffective. They are more annoying than painful, and are never accompanied by any actual "bearing-down" sensation. The primigravida often regards them as true labor-pains, and marvels at the ease with which she bears them, but the woman who has borne children or the experienced obstetric nurse is seldom if ever misled by them.

TRUE LABOR-PAINS occur with a regularity that is almost perfect, and if they are timed by the clock it will be found in the majority of cases that, at the beginning, they will occur at intervals of about half an hour and that the periods between them will be exact almost to a minute. In timing the pains in this way the nurse should not let the patient know what she is doing, as the knowledge may have a suggestive influence on their frequency.

The gradation between false and true pains is an almost imperceptible one, the first indication of the appearance of true pains being usually the establishment of this regularity in their recurrence. Soon, however, the true pains begin to take on their characteristic qualities. They become longer and somewhat more painful. Beginning in the back they extend around to the front, the sensations in the front of the abdomen remaining after those in the back have ceased, and they are accompanied by a distinct "bearing-down" feeling. True pains cannot be said to be especially painful in the early part of the first stage, but the patient usually realizes fully that her labor has begun, and her face often wears a somewhat anxious expression, with a slight flushing and drawing of the features at the acme of the pain.

As soon as the nurse has decided, from the character of the pains, that labor has actually commenced, she should notify the physician in charge of the case. It does not necessarily follow that he will respond personally to this notification, but it is proper that he should know that his patient is in labor, so that he can arrange his time and engagements and be ready to answer promptly the second and peremptory call.

As soon as the physician has been notified the nurse should begin to arrange the room for the labor, being guided as to haste by the frequency of the pains.

The room is to be warm (70° to 72° F.), well lighted and well ventilated; hot and cold sterile water and provision for boiling the physician's instruments are to be provided; and the needed supplies described in Chapter XI. are to be arranged in a convenient manner and place. *The patient is to receive an enema of soapsuds, one pint, and spirits of turpentine, one teaspoonful,* and is then given a warm bath, either in the tub or by sponging, as the circumstances will permit. The external genitals are to be cleansed with special care, and the pudendal hair, if long and abundant, must be clipped short with scissors.

The patient's hair is to be braided neatly in two braids; she is dressed in clean night-gown, slippers, and bath-robe; and a vulva pad is applied and pinned to the night-gown or to a band, to protect the parts and absorb any discharge that may escape from the vagina.

From the beginning of the true pains the patient is not to be allowed to use the water-closet *under any circumstances whatever,* and if the enema of soapsuds and turpentine has been effective, she will have no occasion to do so except to empty the bladder. This need, however, will usually be frequent, and the urine is to be voided in a clean vessel, which is to be removed at once from the room, cleaned thoroughly, and returned with as little delay as possible. It will, of course, be necessary to remove the vulva pad when the urine is voided, and after the act has been accomplished the external genitals are to be bathed carefully and a fresh vulva pad applied. *A pad that has once been removed must never be replaced, no matter how clean it may appear to be, and there can be no exception to this rule because of the danger of carrying infection to the vulva.*

The woman is to be encouraged to keep on her feet the greater part of the time, to favor descent of the head into the pelvis, and the nurse should endeavor to make this trying ordeal as light as possible by cheering words and a hopeful manner. The patient is to be dissuaded from attempting to help herself

by voluntary straining of the abdominal muscles, for such efforts do no good at this time and only exhaust her and wear out her strength; and it is even a good plan to keep up her energy during the first stage by providing some light refreshment, such as tea and toast or soda-biscuits, of which she can partake whenever she feels so disposed.

If the membranes rupture in the first stage the danger of prolapse of the cord must be kept in mind, and the physician should be notified immediately, but this should be done without the patient's knowledge, for, especially if it is her first labor, the accident is apt to cause her great alarm. She should be informed at once of the nature of the watery discharge, and assured that it is a perfectly natural phenomenon and of no consequence whatever. If her night-gown or other garments have become soaked with amniotic fluid, they must be replaced at once with dry clothing.

When the pains occur as often as every five minutes the physician is to be summoned peremptorily, and even sooner than this if he lives at a considerable distance from the patient or in case there is any difficulty in getting word to him. Many physicians give the nurse positive orders as to when they wish to be called, but in the absence of any such explicit directions she may regard the above rule as a safe guide in the majority of cases.

This degree of frequency in the occurrence of the pains is a fair indication of the beginning of the second stage of labor, and when the pains take on the characteristic features of those of the second stage the diagnosis of the condition is not at all difficult. *The pains of the second stage are longer, much more severe, and the patient's face is suffused with blood until, at the height of the pain, it is almost cyanotic, while the neck swells and the large blood-vessels stand out like knotted ropes and pulsate violently.*

As soon as it is apparent that the patient is in or near the second stage of labor she is to be put to bed, for at this time the os uteri is, of course, fully dilated, and if she is allowed to remain on her feet precipitate labor may occur. As a rule, the

patient is quite willing to go to bed when this period of labor is reached, and in many cases she is unable to keep up any longer even if she were allowed to do so.

The nurse should have ready, on the arrival of the physician, hot water, soap, and nail-brush for the disinfection of his hands, antiseptic solution (usually bichloride solution, 1 to 2000), and sterile vaseline or lubrichondrin. As many physicians, unfortunately, neglect to provide themselves with an apron or gown, the nurse should also have in readiness a small clean sheet, which can be pinned around his neck and again about the waist, making a fairly good substitute for an operating-gown.

After the arrival of the physician he will, of course, take charge of the further management of the case, and, if the patient is still on her feet, decide when she is to be put to bed.

If the case is at all advanced the physician will wish to make a vaginal examination at once, in order to determine the amount of dilatation of the cervix and inform himself as to the progress that the woman has made, and while he is disinfecting his hands the nurse will prepare the patient for examination.

The woman is to lie on her back, on the right side of the bed near the edge, covered with two clean sheets, each folded in half and arranged as follows: one sheet is to lie across the bed, covering her lower limbs and extending from the foot-board to a point midway between the patient's knees and hips; the other, covering the rest of her body, also lies crosswise of the bed and overlaps the first by a few inches (Fig. 55). Before the sheets are finally adjusted the nurse will remove the vulva pad and carefully bathe the external genital organs with warm sterile water and Tincture of green soap, and a fresh piece of absorbent cotton. When the physician has completed the disinfection of his hands the nurse will squeeze some vaseline or lubrichondrin from a collapsible tube on his index and middle fingers, taking care that neither the tube nor her own hand comes in contact with the examining fingers. The patient should now be directed to draw up and widely separate her knees, while the nurse raises the upper of the two sheets so that the physician can see the vulva, and holds it in such a position that it cannot

FIG. 55.—Arrangement of sheets for vaginal examination.

FIG. 56.—Vaginal examination.

come in contact with his hands, but serves as a screen to prevent the woman from appreciating the extent to which she is exposed (Fig. 56).

The writer prefers this method to the older one of covering the limbs and abdomen with a single sheet arranged in "horse-shoe" form, which is always getting in the way or becoming disarranged, and which, from the nature and method of its adjustment, is far more suggestive to the patient than the one described in detail.

If the physician's outfit contains a Kelly pad (Fig. 57), it is to be placed under the patient, with its apron draining into the

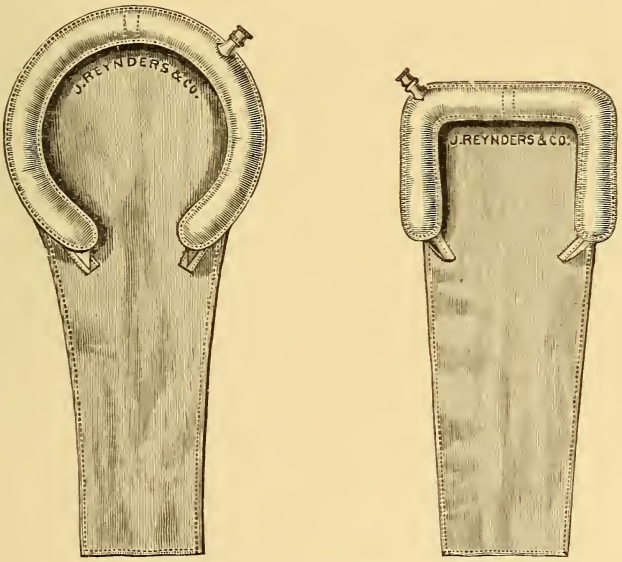


FIG. 57.—Kelly pads.

slop-jar or pail, and covered with a clean towel tucked well under the edges of the pad, so that it will not easily slip out of place.

The nurse is to see that fresh solutions for the hands are always ready and at a proper temperature (100° F.); that soiled or bloody towels and sponges are removed at once from the

room, or at least kept out of sight as far as possible; that scissors and tape for tying the umbilical cord and boric acid wipes for the infant's eyes and mouth are ready the moment they are needed; and that a warm woollen blanket is provided to wrap the baby in as soon as it is born.

All the instruments required are, of course, to be provided by the physician, and he will, on his arrival, hand over to the nurse whatever he thinks he may need for the particular case, which are to be boiled at once for fifteen minutes so that they will be ready the moment they are called for. In perfectly normal cases about all that are needed are scissors, catheter, and douche-tube, but some physicians add to these a dressing-forceps and a tenaculum or volsellum. In emergency cases, when there is nothing at hand, an ordinary pair of clean scissors and a piece of new white cotton twine may be boiled and used for cutting and tying the cord.

During the *second stage*, when the pains are most severe, the nurse should use every art at her command to encourage the patient with reassuring words and helpful assistance. A great deal can be done to add to the comfort of the patient by holding her hands at the height of the pains and, in the intervals between them, by rubbing her back and legs, which are often lame and cramped. Many women like to have something to pull on as the pains occur, and there is no objection to fastening a twisted sheet to the foot of the bed or cot, on which the patient can brace herself, as it were, when her suffering is most severe (Fig. 58).

Chloroform is indicated at this stage unless there are positive objections to its use, and in normal cases the duty of administering the anæsthetic usually falls to the nurse. The patient's face should first be well anointed with vaseline to prevent irritation of the skin by the drug, her clothing is to be loosened about the waist and neck to remove any possible interference with respiration, and false teeth, chewing gum, or any other foreign substance that may be in the mouth is to be taken out, lest it should be swallowed as the patient loses consciousness. In these cases the chloroform is to be given to the "obstetrical degree" only. That is to say, it is to be administered only at the beginning of

each pain and continued only as long as the pain lasts. This will be enough to benumb the nervous system and "take the

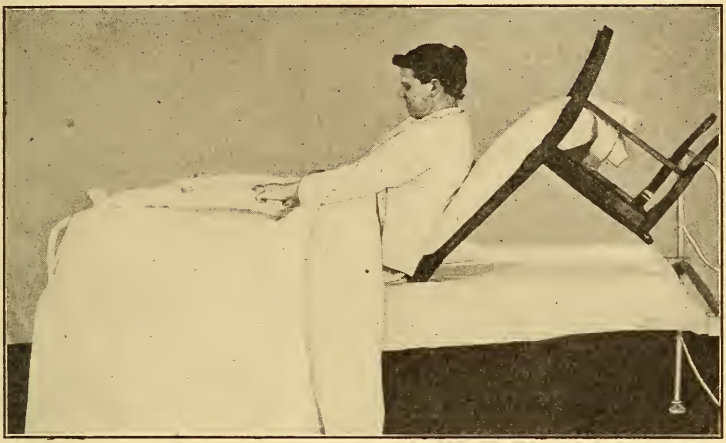


FIG. 58.—Beginning of second stage of labor. Patient bracing against chair and pulling on sheet at the height of a pain.

edge off the suffering," but the patient will at no time be entirely unconscious, and in the intervals between the pains she will be perfectly rational. In operative cases, where complete surgical

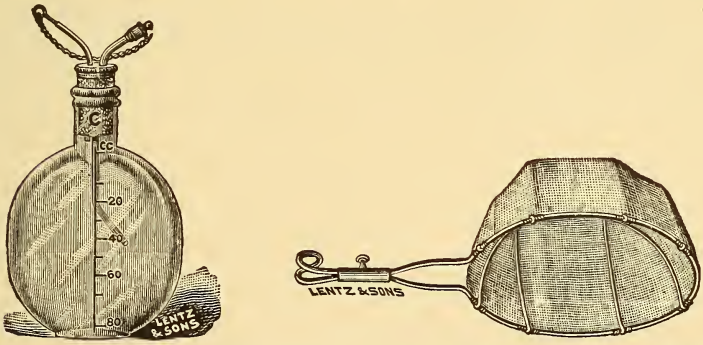


FIG. 59.—Esmarch outfit for the administration of chloroform. Dropper-bottle and mask.

anæsthesia is required, the nurse should not be expected to shoulder the responsibility of administering the chloroform, espe-

cially as her services will undoubtedly be needed as direct assistant to the operator, and another physician should be called in to act as anæsthetist.

The best method of administering chloroform is with the *Esmarch outfit* (Fig. 59), which consists of a mask and a dropper bottle. The bottle is filled about half full of chloroform and corked, and when the stoppers are removed from both the little tubes that pass through the cork the contents will escape in a fine stream from the smaller of the two when the bottle is tilted to the proper angle. Before beginning the administration of the anæsthetic the skin of the face must be anointed with vaseline and the eyes shielded with a folded towel as a protection against the irritating action of the drug. The mask is placed over the nose and mouth of the patient at the beginning of a pain, and the material with which it is covered is kept wet with the anæsthetic as long as the pain lasts (Fig. 60). The mask is to be removed from the face at the end of each pain and not replaced until the beginning of the next one, and a close watch must be kept of the patient's pulse and especially of her breathing and the general appearance of her countenance. *Irregularity of the pulse, failure of respiration, and sudden pallor are all danger symptoms, and the physician's attention must be called to them at once if they appear.*

Fortunately, the use of chloroform in obstetric practice is attended with little or no danger, especially when the anæsthesia is carried to the obstetrical degree only, and what slight danger there may be is minimized by the employment of the Esmarch apparatus, which nearly every physician carries in his maternity outfit.

In the absence of the Esmarch inhaler the drug may be administered on a small handkerchief folded square and held over the face about an inch and a half from the nose. Care must be taken not to let the handkerchief approach the face too closely, for, unlike ether, which is to be inhaled in its full strength, *chloroform must be diluted with a large proportion of air (ninety per cent.) to be taken with safety.*

When chloroform is administered at night by either gas- or

lamp-light, many persons, including physicians and nurses, suffer from irritation of the larynx of a most severe type, due, probably, to the disintegration of the drug by the flame and the liberation of chlorine gas. This causes paroxysms of coughing which often make it necessary for the sufferer to leave the room, and in one case at least death has resulted from the violence of the

FIG. 60.—Administration of chloroform. Patient's eyes protected by folded towel; third finger of nurse's right hand taking pulse at the facial artery under the margin of the jaw.

attack. The patient usually escapes because she is anæsthetized to such a degree that the irritating effect of the chlorine is unnoticed by her larynx.

This untoward action of the drug can usually be prevented by keeping a good-sized cloth soaked with ammonia hanging from the chandelier or near the lamp. The ammonia will combine with the chlorine to form the bland and unirritating muriate of ammonium. Care must be taken, of course, to avoid overdoing the matter and making the remedy as bad as the disease

by filling the room to suffocation with the fumes of ammonia, but this will not happen if the ammonia cloth is merely kept wet with the liquid. It must hang near the light, and if any irritating effects of the chloroform are felt more ammonia must be used, for a sufficient quantity will almost invariably produce the desired result.

Ether is not generally used as an anæsthetic in obstetric practice, although it finds favor with certain operators.

The method of its administration differs materially from that of chloroform, and, while ether is in many ways the safer of the two drugs, its proper exhibition calls for greater skill and experience and will not, ordinarily, be required of the nurse unless she has had special training in its use. In emergencies, however, the nurse may be called upon to anæsthetize a patient with ether instead of chloroform, and a brief description of its administration may be of value in this place.

As in chloroform anæsthesia, the patient's clothing must be loosened at every point, so that her respiration will be absolutely unhampered, and any false teeth or other loose objects must be removed from her mouth. The woman lies flat on her back, with no pillow under her head, and during the entire period of anæsthesia the neck must be extended and the lower jaw held up by pressure against the chin to prevent closure of the epiglottis and interference with respiration. Several towels must be within easy reach, as vomiting is very apt to occur during the inhalation of the drug.

Many forms of inhalers, some of them decidedly complicated, have been devised for the administration of ether, but in the emergency cases that may fall to the nurse an improvised "cone," made of folded newspaper covered with a towel or muslin, will usually be employed. The cone may be put together with safety-pins or needle and thread, and the towel or muslin should cover it inside as well as out. It should be of such a size that it will fit snugly over the patient's mouth and nose, and its depth should be from six to seven inches. A piece of absorbent cotton or a crumpled gauze about the size of a lemon is placed inside the cone and saturated with ether, care being

taken that it is wedged securely in the inhaler with sufficient space between it and the patient's face to allow free vaporization of the drug.

The cone is now placed over the patient's nose and mouth, but a short distance away from her face to avoid the choking sensation caused by the too sudden exhibition of the anæsthetic in its full strength.

As soon as the woman's throat and lungs have become accustomed to the irritating action of the vapor, the cone is to be brought gradually towards her face until it fits over it snugly.

The gauze or cotton inside the cone should be kept saturated with the drug, and for this purpose about a drachm of ether must be poured in every two or three minutes. In doing this the bottle or can is to be uncorked and the cone removed for an instant only, as the fresh ether is added, and replaced immediately over the face. A very few inspirations of air will be enough to delay the action of the anæsthetic materially.

After five or ten minutes, and often when the patient seems to be passing quietly into a state of unconsciousness, she may suddenly begin to struggle violently and use all her strength to tear the cone from her face and get off the table or out of bed. This is due to the primary exhilarating effect of the drug, and is a condition to be watched for in every case. The patient is partly anæsthetized, as will be evident from her incoherent speech and unnatural behavior, and she must be securely held by assistants and fresh ether given freely until she becomes quiet again.

The essential point in controlling the struggles of a partially anæsthetized patient consists in keeping all her limbs extended at full length so that she cannot get a "purchase" on anything. Her arms must be held straight out at her sides, so that she cannot bend her elbows, and sufficient downward pressure must be exerted just above her knees to prevent her drawing up her legs.

At about this time the patient will often begin to vomit, and at the first sign of retching her head is to be turned as far as possible to one side to allow the vomited matter to escape from

her mouth and prevent its possible entrance into the larynx. As this is done the lower jaw is to be drawn upward and forward as much as possible, and fresh ether must be administered freely, for the vomiting will stop as soon as the anæsthesia is complete. The mouth must be wiped out frequently with a towel, or with gauze or cotton in an ordinary sponge-holder, and care must be taken that the tongue is well forward and has not fallen back and occluded the throat.

FIG. 61.—Administration of ether. Cone held snugly over face; chin raised upward and forward and pulse taken at facial artery.

Complete anæsthesia will be attained in from ten to twenty minutes after beginning the administration of ether, and it is maintained by adding about a drachm of ether to the cone every four or five minutes.

During ether narcosis the patient's face should be slightly flushed, but never pale or cyanotic; her respiration deep, possibly stertorous (snoring), but never irregular; and her pulse full, of good quality, fairly rapid, but never intermittent.

The nurse should not only *watch* the respiratory movements

of the chest and abdomen, but *make sure* that respiration is properly carried on by noting that ether vapor actually escapes through the cone with each expiratory act.

As the patient's wrist is not usually within the reach of the anæsthetist, the pulse may be taken at the *facial* artery as it passes under the edge of the lower jaw at about its middle; at the *temporal* artery, just in front of the ear; or at the *posterior temporal* artery, directly above the ear at the margin of the hairy scalp (Fig. 61). When, however, there is any doubt as to the character of the pulse taken at these points, it should always be counted at the wrist as well.

The *danger-signals* in ether anæsthesia are a pallid or cyanotic face, irregularity or shallowness of respiration, and irregularity or extreme rapidity of pulse.

In the majority of cases in which the administration of ether will fall to the nurse the physician will first anæsthetize the patient himself, and whenever the nurse is in the slightest doubt as to the subsequent condition of the woman under operation, she should call upon the physician for assistance or advice without delay.

As soon as the baby is born and the cord is tied and cut, the infant, wrapped in a warm blanket, is to be removed to a safe place, out of harm's way, and the nurse is to return at once to the assistance of the physician. Old grannies and so-called "monthly nurses" have an insane desire to drop everything and wash the baby the instant it is born, but the professional nurse must be entirely above any such ridiculous idea, and not annoy the physician by fussing with the infant when her services are needed at the side of the patient. From time to time, as opportunities offer, she should glance at the child to make sure that it is breathing properly and that there is no *bleeding* from the cord, but if it is well wrapped up and in a warm place it needs no further attention until the placenta is delivered and the mother made entirely clean and comfortable.

The *after-birth* is usually expelled in from fifteen to thirty minutes after the birth of the child, and the nurse must have ready for its reception a bowl or other clean vessel covered with

a warm bichloride towel (Fig. 62), *in which it is to remain until it has been examined by the physician and he has given his consent to its destruction.* The importance of this examination of the placenta lies in the fact that it enables the physician to know if any part of it or of the membranes has been left behind in the uterus.

The nurse will usually be called upon from time to time to relieve the physician in holding the fundus (see Fig. 113), and while she is so occupied he will doubtless take advantage of the opportunity to inspect the infant for deformity or malformation of any sort.

Every moment that is not occupied with other matters is to be devoted to putting the room in order and making the patient clean and comfortable, so that the evidences of the labor may be gotten out of the way with as little delay as possible.

Delivery by the Nurse.—In certain cases the nurse will find it necessary to manage the entire labor herself, either because of precipitate labor or through delay in securing the services of a physician.

It is needless to say that such cases progress rapidly, and that almost before any careful preparations can be made the pains are recurring with such frequency and severity that the patient must be put to bed and given the undivided attention of the nurse.

It seldom or never happens that the nurse and her patient are entirely alone, and usually the husband, some female relative or friend, or a servant can be called upon to get a basin of hot water, add one or two bichloride tablets or prepare some sort of an antiseptic solution, and place it on a chair or table by the side of the patient for the nurse's hands. The boric acid wipes for the infant's eyes and mouth can also be called for, and, as there is never any special hurry about tying and cutting the umbilical cord, there is usually time for the scissors and tape to be boiled in a shallow dish with just enough water to cover them.

If the patient is fully dressed, as may be the case in precipitate labor, some one should take off her shoes and stockings and remove her clothing as rapidly as possible, but without any show

of excitement, by cutting or ripping it if necessary. She should then be helped into a night-gown or, if this cannot be done, covered with clean sheets and blankets; and a pad or thickly folded sheet should be slipped under her buttocks in an effort to protect the bedding and carpet from blood and other discharges.

All these matters may be attended to by the direction of the nurse as she sits or stands by the patient's side and watches carefully the progress of the case, and if she keeps her wits about her and does not lose her head she will have no difficulty in securing an immediate mastery of the entire situation.

As soon as the basin of antiseptic solution is prepared the nurse should wash her hands in it as thoroughly as possible and, with cotton sponges, clean the external genitals carefully, while clean towels placed under the buttocks and about the thighs will do much to prevent the possibility of infection.

Whenever there is time for her to do so, the nurse should, of course, disinfect her hands with the utmost thoroughness, roll up her sleeves, or take them off if they are made in such a way that this is possible, and put on an operating-gown if she has one. The hands are to be disinfected by scrubbing for fine minutes with Tincture of green soap and hot water, changing the water frequently, and then soaking for three minutes in bichloride solution (1 to 2000). The room, the bed, and the patient are all to be prepared for the labor as carefully as the time will allow, and in those cases in which the nurse is called upon to conduct the delivery merely because of prolonged delay in the arrival of the physician she will, of course, have everything in complete readiness.

As the head comes down and begins to distend the perineum the nurse must watch it carefully, and prevent undue stretching of the parts by holding it back at the acme of each pain (Fig. 63). This interference with the descent of the head to prevent its sudden expulsion through the vulva and consequent laceration of the tissues may be kept up for fifteen minutes or more, or until the parts are stretched to their utmost capacity and the head escapes in spite of every effort to hold it. The *essential points* are to delay the descent of the head until complete dila-

tation has taken place and to prevent its *sudden* delivery if possible.

If the membranes have not ruptured, they may, when the case is under the management of the nurse, be left intact until they appear at the vulva, resembling more than anything else in appearance the rounded end of a large bologna sausage. As soon as they protrude in this way and the nurse has convinced herself by careful examination that the presenting object is the amniotic sac filled with fluid, and not any part of the fœtus itself, the patient is to be informed of the nature and harmlessness of the discharge of waters which is about to occur, and the sac is to be ruptured. This may be done easily and quickly by cutting through the tissue with the finger-nail at the height of a pain after a towel has been placed against the vulva to receive the gush of waters.

As soon as the head is born the nurse should feel about the neck for the umbilical cord, and, if it is found, it should be drawn gently to one side or the other until it can be slipped over the head. No force should be used in loosening the cord, for fear of injuring it and causing bleeding.

The mouth and eyes of the infant are now to be carefully cleaned with the boric acid solution, and the face must be held up so that it does not lie in the pool of blood and liquor amnii between the mother's thighs.

There is no occasion whatever for haste in the delivery of the body, even if the face of the infant becomes distinctly cyanotic, and the mother and others in the room may be assured that everything is satisfactory and that there is no danger or cause for alarm. In another moment the uterus will again contract and the body of the child will be expelled.

If only the shoulders appear there is no harm in passing a finger, which has been carefully rinsed in the antiseptic solution, into the axilla and gently extracting the posterior arm. The body will now almost fall out of the vagina, and the infant is to be laid on its *right* side, between the mother's legs, and covered with a warm woollen cloth or the nearest substitute for this which can be secured.

FIG. 62.—Delivery of placenta in dorsal position.

FIG. 63.—Holding back the head to prevent sudden expulsion and the consequent laceration of the maternal tissues.

If the child does not cry vigorously it may be spanked energetically but without too much force, or held up by its heels and slapped sharply on the back four or five times (Fig. 64). If this is not successful, a little ice-water may be splashed briskly

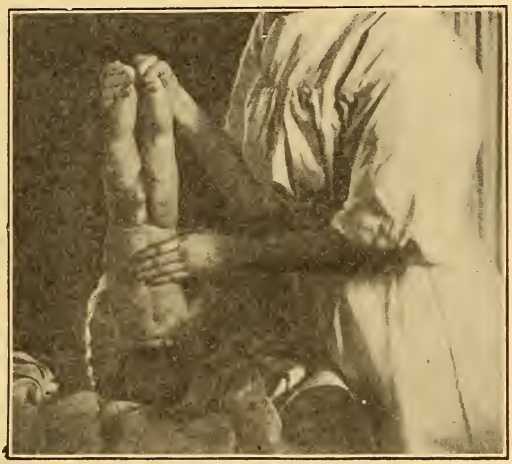


FIG. 64.—Infant suspended by heels. Nurse slapping its back immediately after birth to excite respiratory movements. Umbilical cord clearly shown.

on its chest, but usually the slapping will suffice. In holding the baby up by its heels care must be taken that no traction is allowed to come on the umbilical cord.

The instant the child is born the nurse, or one of those present in the room, must place a hand on the patient's abdomen and grasp the fundus firmly (see Fig. 113), and *this pressure is to be maintained without interruption for the next full hour.* As this is a very tiresome procedure, it is well for those having the matter in hand to relieve each other at fairly frequent intervals. The correct way to hold the fundus is described in detail in Chapter XIX.

There need be no hurry about tying the umbilical cord, and the nurse may safely wait until the pulsations in it have ceased or grown very faint. The first ligature is to be placed about three inches from the infant's abdomen, to leave room for subse-

quent tying in case of hemorrhage, and the second ligature two or three inches from the first. It is a good plan to tie a third tape around the cord, close to the vulva, to serve as a guide to the descent of the placenta. As the after-birth is forced out of the uterus the cord will also escape from the vagina, and the progress of this expulsion can be estimated by watching this third ligature, which at the beginning was as close to the vulva as possible.

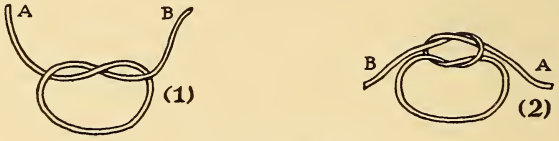


FIG. 65.—Square knot.

The ligature should be tied with a " square knot " (Fig. 65), for the ordinary, or so-called " Granny " knot, will almost surely slip, after a short time, no matter how tightly it may have been drawn when it was applied. The characteristic feature of the " square knot " lies in the fact that both ends pass under the same side of the loop, as shown in the figure, while in the " Granny knot " one end passes under and one over. If hemorrhage occurs from the cord after it has been tied and the child dies or even is seriously weakened by loss of blood great blame will attach to the nurse, and it will be an extremely difficult matter for her to free herself from the stigma of either neglect or incompetency.

Consequently, the nurse who intends to practise obstetrics should make it a point to perfect herself in the method of tying a square knot until she can do so instinctively, and so avoid the possibility of any such accident as has been suggested. It will avail her nothing that the case was an emergency one and that she did her best under most trying and unusual conditions, for people who are desirous of having children allow nothing to escape the fury of their wrath if anything untoward occurs in the conduct of the case, and the fully trained nurse of to-day is regarded by many as the equal of the physician in technical skill.

Be this as it may, it is a very easy matter to learn to tie the square knot snugly and securely, and when this is done properly

there will be no danger of its slipping or of secondary hemorrhage from the cord, except in the case of feeble or premature children, in whom the tendency to bleeding is very great and who must always be watched with the utmost care. As many of the precipitate labors which will fall to the care of the nurse will be cases of premature birth, she must be extremely careful about tying the cord securely, and inspect it for hemorrhage at frequent intervals, tying it a second, or even a third, time if necessary.

The cord must always be tied in two places and cut between the ligatures, for if this is not done and the case should chance to be one of twins, the unborn child might possibly bleed to death from the maternal end of the severed cord.

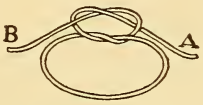


FIG. 66.—Granny Knot.

As soon as the cord is cut the infant, wrapped in a blanket, is to be removed to a safe place, and the nurse should take charge of the fundus for a few minutes, at least, to make sure that it is hard and firm. If it is found to be soft and flabby vigorous kneading of the abdomen should be practised until the uterus again contracts properly.

There need not be the slightest haste about the delivery of the placenta, and while it is usually expelled in from fifteen to thirty minutes after the birth of the child, no harm will result if it is delayed for an hour or more, provided there is no excessive bleeding. It is to be remembered that the uterus is resting during this period, and that when its muscular fibres have recovered from the exhaustion of the labor they will contract firmly and expel the after-birth. Under no circumstances should traction be made on the cord in an effort to pull the placenta out of the vagina, for this will probably result merely in tearing the cord from its attachment, while in rare cases, when the placenta has not entirely separated from the uterine wall, the womb itself may be dragged inside out, causing the condition known as inversion of the uterus (see Fig. 105).

In nearly every case, after a reasonable period of time, the woman will have another labor-pain and the placenta will appear at the vulva, much like a miniature counterpart of the fetal head. It should be received in the palm of the hand and directed into a bowl held for this purpose, and the string of membranes that trails behind is to be extracted with the utmost gentleness and deliberation, to prevent the detachment of any tags or fragments (Fig. 67). The method, formerly advised, of twisting the mem-

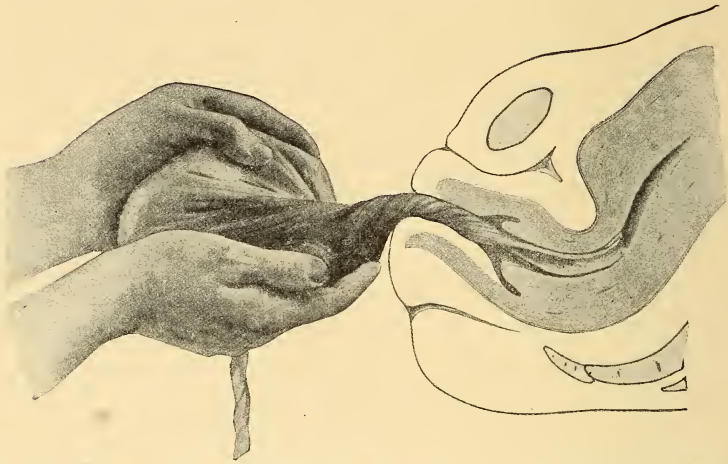


FIG. 67.—Delivery of placenta and membranes. (Bumm.) No traction should be used, but the membranes allowed to fall out of the vagina by their own weight.

branes into a firm cord by turning the placenta over and over on itself no longer meets with general approval and is not to be recommended. All that is necessary is to extract the membranes from the vagina slowly and carefully, taking plenty of time and using no force whatever.

The placenta is to be preserved until the arrival of the physician, in order that he may inspect it and make sure that it is intact.

In PRECIPITATE BREECH CASES, which occur when the infant is small or premature, there are two important points in the management which the nurse must not forget.

Traction on the body, after it has passed through the vulva,

must *never* be made, for it is essential to have the case progress as slowly as possible in order to secure complete dilatation of the parts and afford ample room for the passage of the head.

Pressure must be made on the fundus as soon as the nature of the case is recognized, and maintained until the child is born, in order to prevent, if possible, the extension of the arms above the head.

FIG. 68.—Delivery of the head in breech cases. The child's body is lifted up and backward over the mother's abdomen, and the head is pressed forward, so that the chin, mouth, nose, etc., will be successively delivered.

The diagnosis of a breech presentation can often be made by the nurse, without vaginal examination and before the appearance of the infant's buttocks at the vulva, by the escape of meconium in the vaginal discharge.

As soon as the body is delivered to the level of the umbilicus the cord is to be secured and gently drawn down a few inches, to prevent traction on it when the head is born, and the extruded

portion of the fœtus is to be wrapped in warm towels, which are to be renewed as often as they become cool. This is necessary, not only to prevent chilling the infant, but to avert the danger of respiratory movements while the head is still undelivered, due to the shock of cold air striking the abdomen and chest.

The downward pressure on the fundus in the direction of the axis of the pelvic brim is to be kept up, and, when the shoulders have escaped from the vulva, the arm which is the more easily reached is drawn out of the vagina by passing a finger over the infant's shoulder, down the arm to the elbow, and sweeping the forearm and hand across the face and chest into the world. The other arm is delivered in the same way, and then the body of the infant is raised upward and backward until it almost lies on the abdomen of the mother (Fig. 68) to favor the birth of the head.

Unless the head can be delivered within five minutes after it has passed into the cavity of the pelvis the life of the child will be in great danger from pressure on the cord, and if there is any delay the nurse may pass one or two fingers into the child's mouth, and with those of the other hand under the symphysis pressing on the occiput, attempt to tip the head forward on the chest while the body of the infant is raised upward and backward and firm downward pressure is made by an assistant through the abdominal wall.

Fortunately the cases of breech delivery that will fall to the care of the nurse are seldom attended with any great difficulties, for the very fact of their precipitate character presupposes a small child or a very large pelvis. The chief danger is extension of the arms above the head (Fig. 69), and this can often be avoided by the maintenance of firm pressure on the abdomen throughout the entire course of the labor.

After the child is delivered the further management of the case does not differ from that of vertex presentation.

Twins are not infrequently delivered precipitately on account of the small size of each infant, and unless they are "locked" in such a way that neither can be expelled without artificial aid (Fig. 70), twin births seldom or never give any trouble to the

medical attendant. As the babies are small, the first is delivered with very little difficulty, and the birth of the second is accomplished with the utmost ease, because the passages are already dilated fully and there is nothing to interfere with its descent.

FIG. 69.—Arms extended in breech delivery. The most serious complication that can arise in the extraction of the after-coming head.

None of the other abnormalities of position and presentation possesses any special interest to the nurse, for, unless they are of such a precipitate character that delivery is accomplished within a very short time, there will be ample opportunity to secure the services of some physician, even if the regular medical attendant cannot be reached.

When the nurse finds, on her arrival, that the baby and possibly the placenta are born and lying in the bed, her first duty is to grasp the fundus with as little delay as possible and see if its contraction is satisfactory, and then make sure that the child is not lying face downward in the blood and discharges and in danger of strangling. As soon as the fundus is firm and solid

the cord may be tied and cut and the infant turned over to some one who will wash its eyes and mouth and wrap it in a warm blanket.

FIG. 70.—Locked twins. (R. Barnes.) First child partly born in breech presentation, the second lodged with the face under the chin of the first.

In all cases of labor occurring in the absence of the physician the nurse must keep a cool head, for the patient and those about her are usually in a state of great excitement and turmoil, and this may be enough to cause relaxation of the uterus and troublesome hemorrhage.

A level-headed nurse, who shows no trace of nervousness or fear, can often change the entire picture in an instant and bring order and quiet out of chaos with a word and an air of authority and self-confidence.

XVI

Operative Delivery

OPERATIVE DELIVERY may be either *instrumental* or *non-instrumental.*

INSTRUMENTAL DELIVERY may be further divided into three classes,—*cutting operations, non-cutting operations,* and *mutilation of the fœtus.*

The NON-INSTRUMENTAL form of delivery consists in *turning* the fœtus with the hands from an undesirable into a desirable position in the uterus. This operation is termed VERSION, and may be performed in any one of three ways,—by *external* manipulation through the abdominal wall alone, called "EXTERNAL VERSION;" by *internal* manipulation through the vagina alone, called "INTERNAL VERSION" (Fig. 71); and by a *combination* of these two methods, in which one hand is placed on the abdomen of the mother and the other in the vagina with the finger-

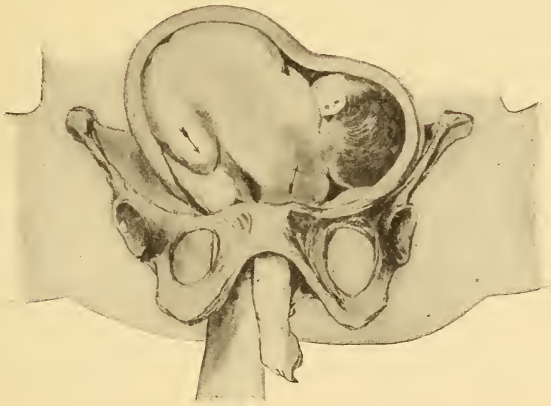


FIG. 71.—Internal version. (Garrigues.) Entire hand in the uterus grasping a foot As the foot is drawn down the protruding arm will be drawn up into the womb, and the child will be delivered by the breech.

tips in the uterus, called "COMBINED VERSION" or the "BRAXTON-HICKS METHOD" (Fig. 72).

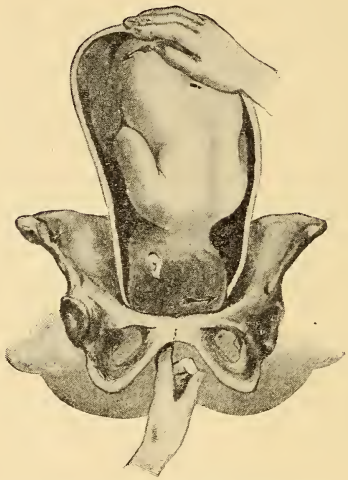


FIG. 72.—Combined or bipolar version. (Garrigues.) The finger in the vagina is assisted by the other hand on the abdominal wall.

EXTERNAL VERSION can only be performed before labor has begun, or immediately after and before the membranes have ruptured. It is often employed to convert a breech or transverse presentation into that of the vertex when the abnormality is recognized at a sufficiently early date to admit of the necessary manipulation.

The COMBINED, BIPOLAR, or BRAXTON-HICKS method has a not much wider field of usefulness than the external method, and must also be done before or very early in labor. The finger-tips in the uterus push the undesired presenting part to one side, while the other hand of the operator presses through the abdominal wall and forces the desired fetal pole into the pelvis. The operation requires considerable skill and great patience and perseverance, and really amounts to turning the fœtus around in the uterus and passing it along in a gradual, jerky way over the finger-tips until it is in a proper position.

Neither EXTERNAL nor COMBINED version call for the admin-

istration of an anæsthetic unless the patient is in an extremely nervous condition or her abdominal wall is rigid and unyielding. The operation is not at all painful, but is often unsuccessful, either because it proves to be entirely impossible, or, as is more often the case, because the fœtus returns to its original position within a few hours.

The patient is to lie on her back, with her knees drawn up enough to relax the abdomen, and as soon as the fetal position has been corrected a firm binder should be applied with long pads on each side of the belly to prevent any change of position.

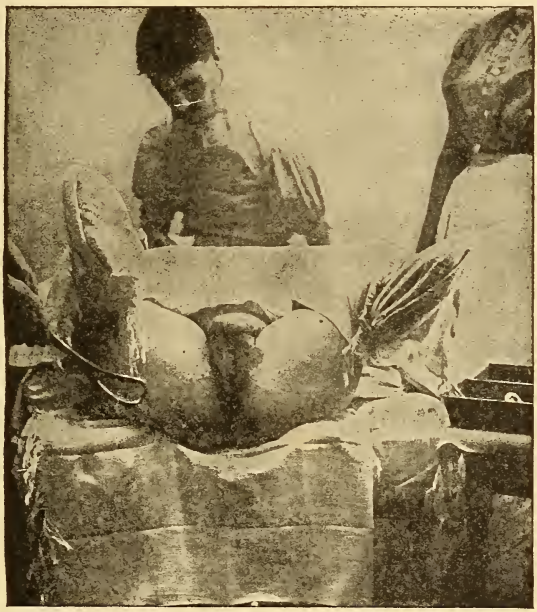


FIG. 73.—Lithotomy position. Limbs supported in author's leg-holder and field of operation surrounded with sterile towels.

In these two forms of version the head of the fœtus is almost invariably the part that is brought into the pelvis, and frequently, as soon as this is accomplished, the physician will rupture the membranes artificially and allow labor to proceed at once.

When INTERNAL VERSION is performed the entire hand is introduced into the uterus, and instead of the head, as in the external and combined methods, a foot is grasped and brought down into the vagina, or even out of the vulva, converting the case into one of breech delivery (see Fig. 71).

The patient is to be placed on her back in the lithotomy position, with her legs elevated and held by assistants or supported in a leg-holder (Fig. 73). Anæsthesia is always necessary, and should be carried to the degree of complete unconsciousness. The os uteri must be dilated sufficiently to admit the closed fist of the operator before the operation is begun, or rupture of the uterus may result; the membranes must, of course, be ruptured, in order that the surgeon may grasp a foot, and the bladder must always be empty.

While external and combined version carry no danger whatever to either mother or child except, in the latter variety, through possible infection of the uterus by a surgically unclean operator, internal version is extremely dangerous to the infant, and to the mother is one of the most perilous operations of surgery, not excepting those which necessitate opening the abdominal cavity.

Of the NON-CUTTING instrumental operations, the most common is FORCEPS DELIVERY.

FORCEPS are merely metal substitutes for hands, which can grasp the sides of the fetal head, or rarely the breech, and draw it down and out of the pelvis (Fig. 74).

FORCEPS OPERATIONS are divided into three classes,—high, medium, and low. The HIGH operation is done when the head is at or above the pelvic brim. It is extremely dangerous to the mother on account of the possibility of rupture of the uterus, and may be even more serious than version. The MEDIUM operation is done when the head has passed through the brim but lies in the vagina and does not yet distend the perineum. The LOW operation is done when the head lies well down on the perineum and pushes forward the vulva so that it is, in many cases, in plain sight.

In all forms of forceps deliveries the os uteri must be fully

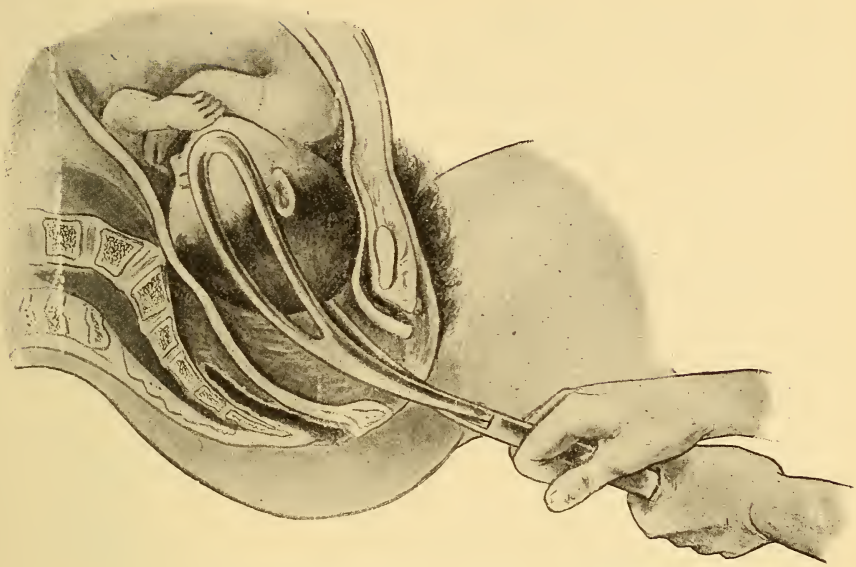


FIG. 74.—Forceps applied to head of brim. (Garrigues.)

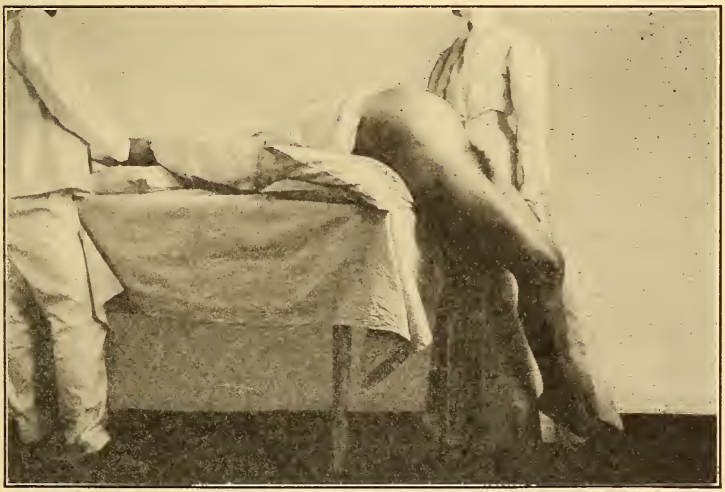


FIG. 75.—Walcher posture. This position tilts the pelvis forward and increases the true conjugate diameter nearly half an inch.

dilated, the membranes ruptured, and the bladder empty before the instruments are applied.

The patient lies in the lithotomy position on a bed or table, with her buttocks drawn well over the edge, and, except in the case of a low operation, complete anæsthesia is required. If an anæsthetic is not used the patient may struggle and injure herself severely with the instruments.

In certain rare cases where difficulty is encountered in making the head enter or "engage in" the pelvic brim, the physician will wish the patient placed in the *Walcher posture* (Fig. 75). This consists in lowering the legs until they hang freely over the edge of the table, while the buttocks are raised by means of a thick pillow or a folded blanket. This tilts the pelvis forward, so that there is an increase of nearly half an inch (one centimetre) in the true conjugate diameter of the inlet; but to be effective, the position of the woman must be such that she is just at the point of slipping off the table,—an accident to be guarded against by suitable support from assistants at her shoulders and hips.

The most common types of forceps are the "Elliott" (Fig. 76) and "Simpson" (Fig. 77) patterns, with fenestrated blades,

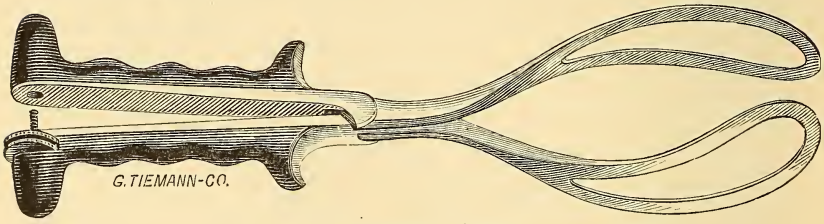


FIG. 76.—Elliott's forceps.

the "Tucker-McLane" instrument (Fig. 78), with solid blades, and the "axis-traction" forceps (Fig. 79), which is only used for performing the high operation. With the axis-traction instrument the handles are used merely for applying the blades, and all the traction force is exerted on a handle-bar, which is attached, after the instrument is in place, to rods fastened to the lower part of the blades. It is an extremely powerful instru-

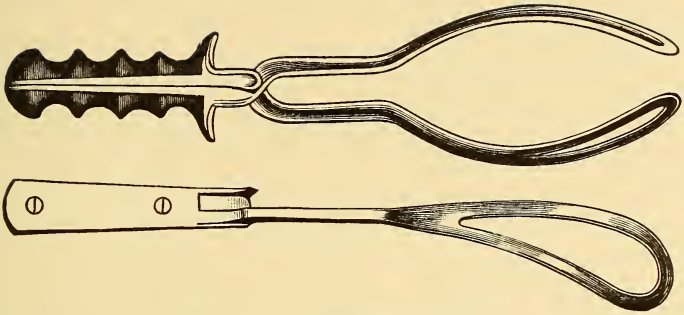


FIG. 77.—Simpson's forceps.

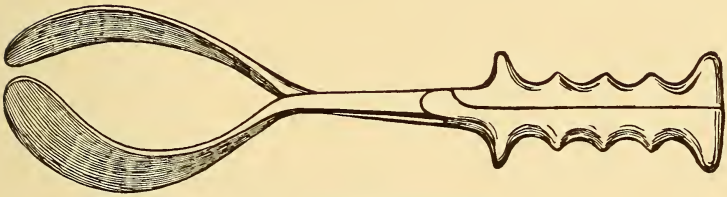


FIG. 78.—Tucker-McLane forceps.

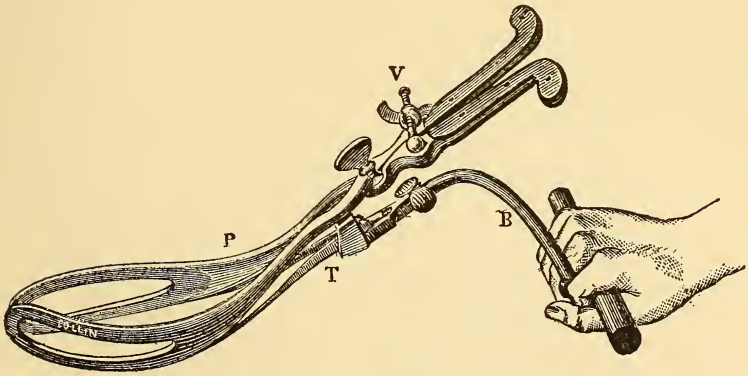


FIG. 79.—Tarnier axis-traction forceps.

ment, and a very dangerous one in the hands of an operator unaccustomed to its use.

Forceps, like other instruments, should be boiled before use, and the nurse should have ready sterile vaseline or other suitable lubricant for anointing them and the hands of the operator.

The INDICATIONS for the performance of version or the use of forceps do not especially concern the nurse, but in general it may be said that external and combined version are performed as prophylactic measures to correct a malposition before or early in labor; internal version is done when, for any reason, speedy delivery is necessary, as in cases of eclampsia or of hemorrhage; low and medium forceps are chiefly indicated in cases of uterine inertia, when the patient is exhausted after prolonged expulsive efforts; and high forceps are used usually on account of pelvic contraction or overgrowth of the fœtus. These statements are, of course, made in a very general way, and must not be regarded in any other light, for the subject is a very complex one and cannot be treated briefly.

Often, before performing version or using forceps, the surgeon finds it necessary to dilate the cervix artificially. He may do this with his fingers or hands, or he may use rubber bags distended with water. These bags are of two kinds,—the "Barnes" bag (Fig. 80), which is fiddle-shaped, and the "Champetier de Ribes" bag (Fig. 81), which is conical. Both varieties come in sets of different sizes, and the largest one that can be inserted is passed into the cervix and slowly distended with water pumped in through a Davidson syringe (Fig. 82). The water should be warm (110° F.), and must invariably be sterilized by boiling, so that if a bag bursts the accident will cause no danger of infection. The bags themselves should, of course, be boiled to sterilize them inside and out, and before this is done the nurse should test each bag by pumping it full of water to make sure that it does not leak.

The bag, whether of the Barnes or Champetier de Ribes pattern, is passed into the cervix by means of a specially constructed instrument or with an ordinary sponge-holder. In private practice the nurse will often be called upon to hand the

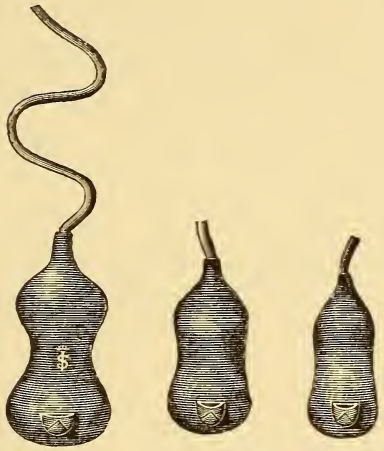


FIG. 80.—Barnes's bags. For rapid dilatation of the cervix.

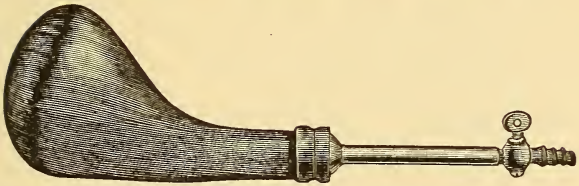


FIG. 81.—Champetier de Ribes bag. For dilatation of the cervix.

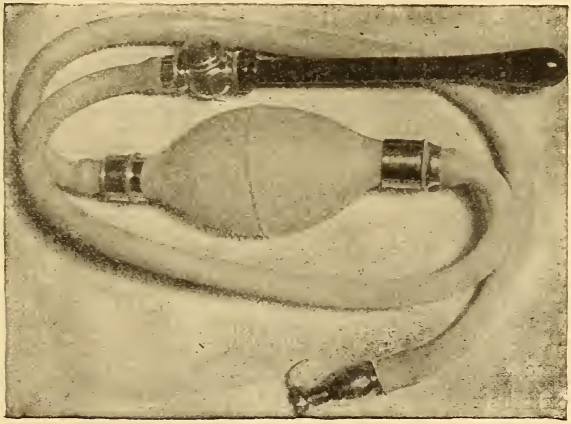


FIG. 82.—Bulb and valve, or "Davidson" syringe.

bag, grasped in the forceps, to the surgeon for introduction, and it should be rolled or folded as compactly as possible and secured between the blades of the instrument, as shown in Fig. 83.

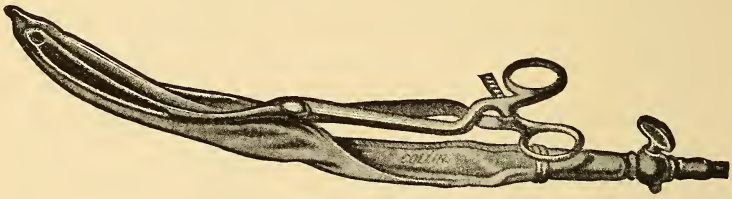


FIG. 83.—Bag in grip of forceps.

The most important of the CUTTING OPERATIONS on the mother is that by which the child is extracted through an incision in the abdominal wall and uterus. This operation is called "CÆSAREAN SECTION," the name being supposed by some authorities to have reference to the alleged fact that Julius Cæsar was born in this manner, while others maintain that the word is derived from the Latin *cæsus,* from *cædere,* to cut.

CÆSAREAN SECTION may be performed in one of two ways, —the entire uterus and its appendages may be removed, or the uterus may merely be incised, the infant and placenta extracted, and the wound closed with catgut sutures, after which the abdominal incision is closed in the ordinary way.

Formerly, when the Cæsarean operation was one of the most dangerous in surgery, it was customary to remove the uterus, ovaries, and tubes, if for no other reason than to prevent the possibility of a subsequent pregnancy, but at the present time there is so little danger attached to this form of delivery that most operators prefer to leave the uterus, unless it is itself the seat of disease.

Cæsarean section is not to be regarded as an emergency operation. That is to say, it should not be performed without due preparation, and never, if it can be avoided, when the patient is exhausted after protracted labor and futile attempts at delivery by forceps or version. Under such circumstances it

is very apt to result fatally to the mother either from shock or infection or both, while, if it is performed by a competent surgeon either just before or immediately after the natural onset of labor, with the patient in good condition and all necessary conveniences and assistants at hand, it is almost universally successful. Consequently, it is easy to understand that the best results in Cæsarean section will follow careful and thorough antepartum examination, by which the surgeon may know in ample time that the patient cannot by any possibility be delivered of a living child through the natural passages at full term or at any period of pregnancy sufficiently advanced to permit of its living. It is hardly necessary to say that the operation subjects the child to no danger whatever, and that if it is in good condition at the time when the abdomen is opened it will be delivered successfully.

FIG. 84.—Pelvic tumor preventing delivery. (Garrigues.) Large ovarian cyst, in front of head, obstructing the genital canal.

The chief indication for Cæsarean section is contraction or deformity of the pelvis which is so marked that it is impossible for a viable child to pass through it even with the assistance of forceps or version, and it may also be rendered necessary by the presence of abdominal tumors (Fig. 84), cancer of the cervix, overgrowth of the fœtus, monstrosity, certain cases of

twins, and certain malpositions of the fœtus which cannot be corrected.

In malignant disease (cancer) of the cervix the uterus and appendages are usually removed at the time of the operation, unless the mother is already in a hopeless condition and the section is performed solely in the interest of the child.

As in any other abdominal operation, the patient lies on her back on a firm table, with a Kelly pad under her buttocks (Fig. 85). All the hair on the abdomen, mons veneris, vulva, and peri-

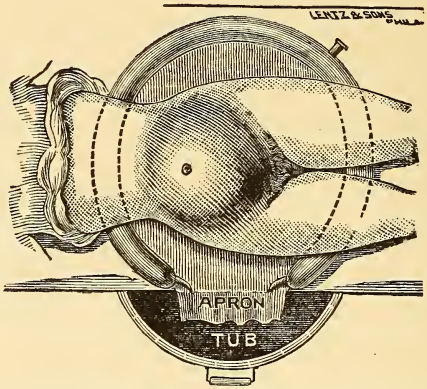


FIG. 85.—Kelly pad in position under patient, with apron draining into tub or pail.

neum is to be carefully shaved off, and the belly, external genitals, and thighs scrubbed and disinfected with the utmost care. The vagina is also usually made as sterile as possible, but this is generally performed by the surgeon or his assistant, and need not be taken up by the nurse, except under definite instructions.

The case calls for at least two nurses, and four assistants to the operator. The head nurse has direct charge of the solutions, irrigation, and dressings, and the second nurse makes herself generally useful. The operator stands at the right side of the patient, facing her head; opposite him is the first assistant, facing the patient's feet. Standing on the same side of the patient as the first assistant, and facing him, is the second assistant, whose duty is usually to grasp the blood-vessels at the

cervix after the abdomen is opened and control hemorrhage as much as possible when the uterus is incised. The third assistant gives the anæsthetic, and the fourth stands behind the operator, out of the way, ready to take charge of the baby the instant it is extracted. The head nurse stands between the first and second assistants, facing the operator, but at a sufficient distance from the patient to be out of the way, and at her side should be a table with flasks (Fig. 86) or pitchers of saline solution (six-

FIG. 86.—Sterile salt solution in flasks.

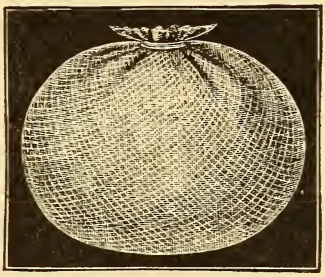


FIG. 87.—Sponge made of cotton and gauze.

tenths per cent.) at a temperature of 118° F. and plenty of hot sterile water, cotton sponges (Fig. 87) in holders (Fig. 88),

FIG. 88.—Sponge-holder.

intestinal pads (Fig. 89), and iodoform gauze strips (five per cent.) in tubes (Fig. 90) for packing the interior of the womb before the uterine wound is closed. The pads, for holding back the intestines as the uterus contracts, must be supplied with long tapes and carefully counted and recorded before the beginning of the operation. From time to time the head nurse will be called upon to pour hot salt solution over the uterus to

stimulate contractions, and she must be ready with this at a proper temperature (118° F.) at a moment's notice.

The second nurse must keep a close watch on her superiors, so that she can obey a glance instantly.

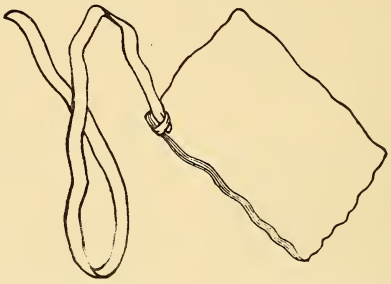


FIG. 89.—Intestinal pad of folded gauze. Usual size about eight by ten inches. The tape extends out of the wound during the operation to avoid the possibility of leaving a pad behind when the abdomen is closed.

The anæsthetist is to be provided with a small table for his hypodermic syringe, tongue-forceps, throat-swabs, and stimulants, and the surgeon's instruments are laid out (usually by himself in definite arrangement) on a table close by his side

FIG. 90.—Gauze packing.

where he can reach them easily. Some surgeons prefer a fifth assistant to pass instruments, but as this plan increases the danger of infection by bringing another (and unnecessary) pair of hands into the case, it is gradually being abandoned.

The essential things for the nurse to have ready in private practice are:

Protection for the carpet, unless it is removed altogether, for blood and solutions readily escape to the floor.

A firm table for operating, narrow and long. Usually two kitchen tables, placed end to end, answer perfectly. These should be covered with a clean blanket, rubber sheeting, and sterile white sheet, all pinned securely in place.

A table for instruments at the right side of the patient, with space between it and the operating-table for the surgeon to stand. This, of course, is to be covered with sterile towels or sheet.

A table for dressings, packing, solutions, etc., on the left side of the patient, about four feet away, also covered with sterile or bichloride towels.

A small table at the patient's head for the anæsthetist.

Two clean slop-jars or pails, one on either side of the operating-table, for receiving soiled towels and sponges and as much of the blood and solutions as can be directed into them.

Two dozen sterile towels.

Five gallons sterile salt solution, with enough boiling water to raise it instantly to any desired temperature.

Three dozen large sterilized safety-pins.

Pitchers or flasks for pouring salt solution. These must be sterilized and wrapped in sterile or bichloride towels.

Hot and cold water in large pans, and ice, all in a distant part of the room, for resuscitating the baby.

A warm bed for the baby.

A warm bed for the mother, with plenty of hot-water bottles, and provision for raising its foot in case of shock. In emergencies the best hot-water bottles are beer-bottles with patent stoppers, which can be corked rapidly and securely.

Bichloride tablets.

Tincture of green soap or "synol soap," eight ounces.

Four nail-brushes.

Four wash-bowls of good size for hand cleaning.

Two or three extra wash-bowls for solutions.

Hot and cold sterile water for scrubbing the hands.

A WARM room (75° to 80° F.)

A good OVERHEAD light.

The surgeon should bring all neccessary instruments, pads, gauze packing, and dressings, and may be expected to do so unless he expressly instructs the nurse to provide them.

SYMPHYSEOTOMY is an operation once in high favor among certain operators, but now, in view of the almost uniform success of properly timed and skilfully performed Cæsarean section, gradually passing into disuse. It consists in cutting through the cartilage lying between the ends of the two pubic bones at the symphysis pubis and allowing these bones to separate for a distance of about one and one-half inches, so as to make greater space for the passage of the head. The chief objection to the operation is that after this separation has occurred it is not at all certain that enough room will have been gained to permit delivery, and it may, after all, have to be completed with forceps or by version. Moreover, in some few cases the bones have failed to unite after the operation, and the patient has been unable to walk.

The woman is placed in the lithotomy position, and the legs are NOT supported in leg-holders, but are held by two trained assistants whose duty it is to regulate the amount of separation in the joint.

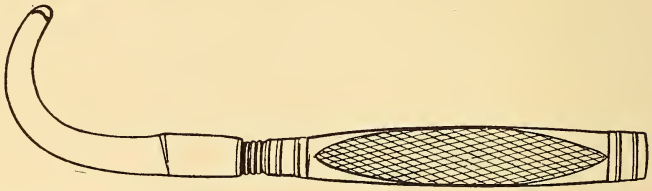


FIG. 91.—Galbiati knife. For cutting through the symphysis pubis in symphyseotomy.

After the bladder has been emptied and the urethra drawn out of the way by means of a male sound passed into the canal, an incision is made directly over the symphysis pubis and a curved knife, known as the "Galbiati knife" (Fig. 91), is hooked under the symphysis and drawn up through the joint until the parts are separated. A little gauze is then packed into the wound to prevent oozing, and while the assistants hold-

ing the legs keep them in such a position that the separation will not exceed one and one-half inches, the labor is allowed to proceed if it will, or is terminated by forceps or version if necessary.

One nurse is all that is needed, and the surgeon requires three assistants,—one to give the anæsthetic and two to hold the legs. The dressings should be provided by the surgeon, and consist of iodoform gauze to pack the wound, cotton, plain gauze, adhesive plaster strips, and a special binder or a many-tailed bandage.

Certain operators join the bones with silver wire, but this is seldom done now, as it is found that firm coaptation of the parts by pressure, with the adhesive plaster drawn tightly around the body, will give equally good results.

The after-care of these cases is very important and very difficult, for under no circumstances can the thighs be separated until union is complete in the joint, and, as this occupies a period of about six weeks, it is extremely trying to the patient and troublesome for the nurse. Dr. Edward A. Ayres, of New York, has devised a "symphyseotomy bed," which is a sort of canvas hammock swung from a high frame and so arranged that a strip can be removed from the bottom and the buttocks uncovered when it is necessary to move the bowels or empty the bladder. In other cases the patient lies flat on a hard bed, with long sand-bags at each side of the hips, and when the catheter is used the legs, tightly bound together, are raised straight up in the air until the thighs are at right angles to the body and the catheter is inserted from below. While but one nurse is actually needed for the *operation* of symphyseotomy, at least two and often three are required to give the patient the proper *after-treatment.*

Episiotomy is an operation designed to substitute for an unavoidable, ragged, central laceration of the perineum a clean incision, made with a knife, at each side of the vaginal floor. The only instruments required are a scalpel (Fig. 92) and suture material, with needles and needle-holder (Fig. 93) for immediate repair after delivery has been effected. No assistants or

special nurse are needed. The operation often causes troublesome hemorrhage, and is seldom if ever performed at the present time.

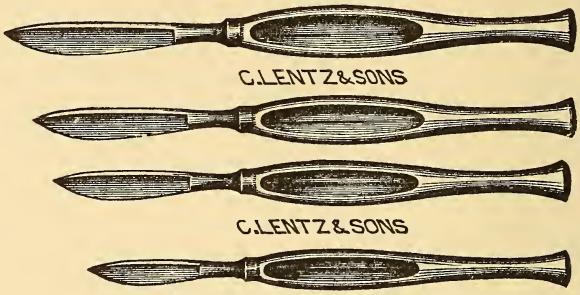


FIG. 92.—Scalpels.

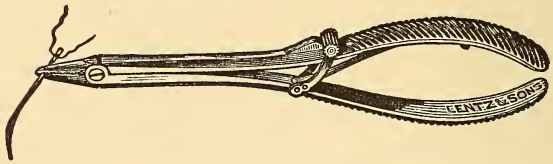


FIG. 93.—Needle-holder.

The MUTILATING OPERATIONS on the fœtus are termed "EMBRYOTOMY," and are divided into CRANIOTOMY, which consists in crushing the fetal head; DECAPITATION, or amputation of the head; and EVISCERATION, or removal of the thoracic and abdominal contents, piece by piece. When evisceration is performed it is usually necessary to follow it by craniotomy, for any condition which will not permit the passage of the chest or abdomen will almost certainly interfere to an even greater degree with the delivery of the head.

Embryotomy in any of its forms is a rare operation, and one that should seldom be necessary if the patient has been under careful supervision throughout the course of her pregnancy. Its indications are, in general, the same as for Cæsarean section, but it is not justifiable unless the child is dead or the mother too much exhausted to withstand the shock of the abdominal operation. This procedure is, of course, neces-

sarily fatal to the child, but the dangers to the mother from the operation itself are very few indeed, the great difficulty in such cases being that it is usually delayed until the woman is in a critical condition, either from exhaustion or from attempts at other methods of instrumental delivery.

Embryotomy is a most unpleasant operation to witness or perform, but it is not, as a rule, painful, and an anæsthetic is required only to spare the mother the distressing spectacle of the mutilation of her infant.

In almost every case the child is dead when the operation is begun, but it must be remembered that it is sometimes justifiable, in the case of a living child, to save the mother or to save one twin (as in cases of locked heads), when otherwise both children and possibly the mother herself would be lost. The nurse may be consulted by the family in these extremely rare cases as to the propriety of performing the operation on the living child, and she must not permit sentimental feelings to close her eyes to the fact that the mother is of far more importance than the unborn child, and that when it is necessary to sacrifice the child in order to save the mother the latter should always receive the first consideration. It does not take a great deal of moral courage to arrive at this conclusion when it is remembered that in these cases delay will usually result in the loss of both lives, while prompt operation and the sacrifice of one may, and probably will, be the means of saving the other.

Craniotomy is performed by perforating the fetal skull to allow escape of brain tissue and then crushing the head into as compact a mass as possible for extraction. The usual instruments for this purpose are the perforator and cranioclast (Figs. 94 and 95), but the best and most modern appliance is the basiotribe (Fig. 96), which resembles somewhat an obstetrical forceps, and which combines in one instrument the perforator, crusher, and extractor.

Decapitation is seldom necessary except in the case of locked twins (see Fig. 70), when the body of the first infant is removed after decapitation, the head pushed out of the way while the second child is extracted, and last of all the severed head

removed with forceps. The operation may also be necessary in impacted shoulder presentations (Fig. 97), where the body is firmly wedged in the pelvis and cannot be pushed up above the brim.

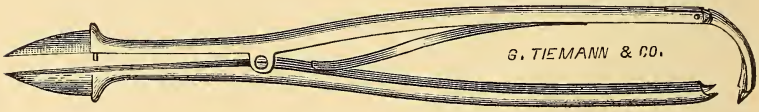


FIG. 94.—Naegele's perforator.

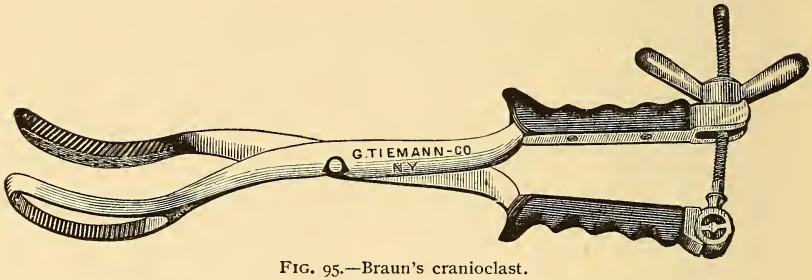


FIG. 95.—Braun's cranioclast.

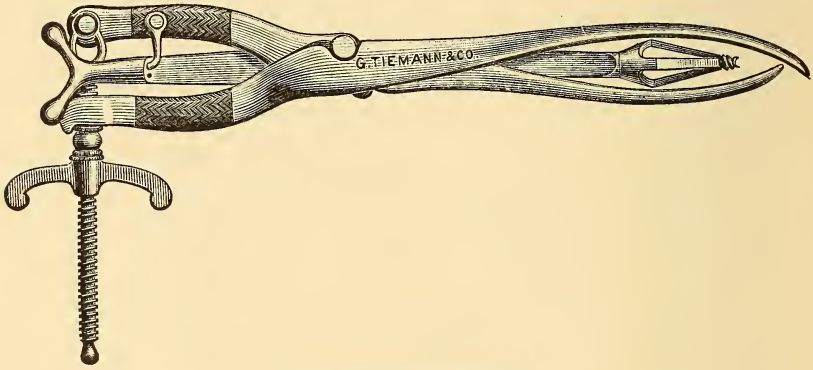


FIG. 96.—Tarnier's basiotribe.

The only special instrument used for decapitation is the "Braun's hook" (Fig. 98), which may either be blunt or sharpened to a knife edge at the concavity of its crook.

Either hook is to be passed over the neck of the fœtus (Fig. 99), and when the blunt one is used the neck is merely broken

FIG. 97.—Impacted shoulder presentation. Delivery in this position is impossible and, unless it can be corrected, decapitation will be necessary.

with a twisting motion and the operation completed with long heavy scissors (Fig. 100). If the sharp hook is employed, all the tissues of the neck are severed with this instrument alone. It is also quite possible to perform the entire operation with the scissors, and many surgeons do not use either hook at all.

FIG. 98.—Braun's key-hook.

EVISCERATION is accomplished with the long stout scissors shown in Fig. 100.

After any form of operative delivery the danger of post-partum hemorrhage is always to be especially feared, and the nurse should have ready an ample supply of hot and cold sterile water for douches or infusions, in case they are needed, and a

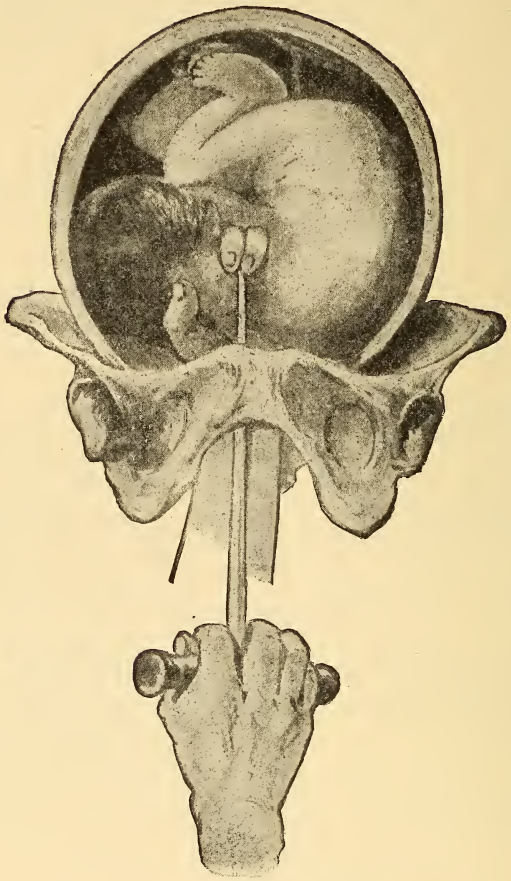


FIG. 99.—Braun's hook applied. (Garrigues.)

FIG. 100.—Long, blunt scissors. For decapitation and evisceration.

number of hot-water bottles with which to surround the patient in case she goes into shock.

The INDUCTION OF PREMATURE LABOR is often indicated in cases of slight pelvic deformity, and is usually performed at about the end of the eighth month of gestation. In these cases there is no need of special haste, and the surgeon merely adopts such measures as will excite contractions of the uterus, after which the labor proceeds as in any normal case at term.

There are three methods in ordinary use for starting up labor-pains. These are: the introduction of an elastic bougie, about the size of a lead-pencil (Fig. 101), into the uterus; packing the

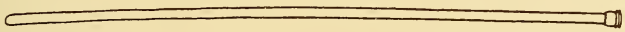


FIG. 101.—Bougie for the induction of labor. About the size of a lead-pencil (No. 12, American scale).

cervix and vagina with gauze; and the use of an elastic bag of small size, which is passed into the cervix, distended with water, and allowed to remain until uterine contractions force it out.

The first, or "Krause," method is the one most commonly employed, and is perfectly safe. Its objections are its uncertainty and the danger of rupturing the membranes and causing "dry labor." The bougie should be about the size of a lead-pencil (No. 12, American scale), with a wire stylet to facilitate its introduction, and it is prepared for use by soaking it for twenty-four hours in cold bichloride solution (1 to 1000) after it has been thoroughly washed with soap and water.

The patient is usually placed in the lithotomy position (see Fig. 124) at the edge of the bed or table, but some physicians prefer Sims's position (Fig. 102) in these cases. No anæsthetic is required, as the operation is absolutely painless and of but a moment's duration.

Labor-pains usually begin in from thirty minutes to twelve hours after the insertion of the bougie. If there are no developments at the end of twenty-four hours, it may be removed by the surgeon and inserted in a new place, or a second bougie

may be passed in alongside of the first. In some cases it is necessary to use three bougies before labor-pains begin. Gauze is

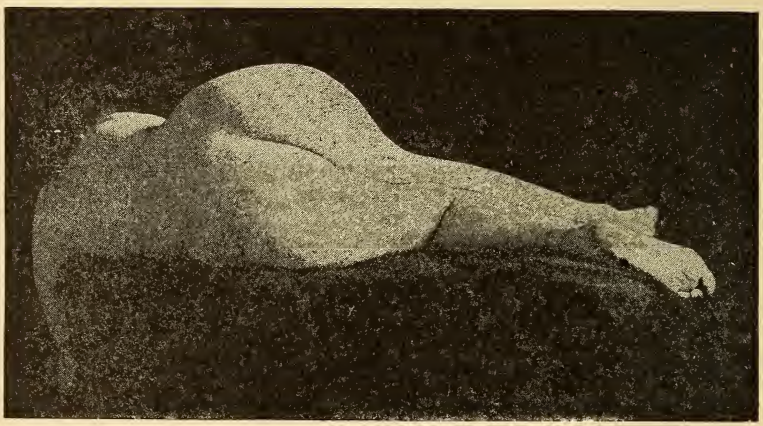


FIG. 102.—Sims's position. The patient lies on her left hip, her chest nearly flat on the table, her left arm hanging over the edge and her right leg drawn well up above the left knee.

required to pack the vagina after the introduction of the bougie, but the physician usually supplies everything of this sort himself.

None of the methods named for the induction of labor is at all painful, and after the bougie, gauze, or bag has been inserted the patient may be up and on her feet as in the first stage of normal labor.

If the membranes rupture, the nurse should report the fact at once to the physician, and he should be notified, as in any other case, the moment true labor-pains are established.

With the exception that these cases are artificially started, they do not differ in any respect from ordinary labor, nor do they subject either mother or child to any greater danger.

When haste in delivery is an essential factor, as in eclampsia or hemorrhage, the surgeon dilates the cervix under complete anæsthesia, either manually or with bags, and delivers by forceps or version. As version offers the most rapid means of delivery at our command, it is usually the method chosen.

XVII

Accidents and Emergencies

THE accidents and emergencies of obstetrics may affect either the *mother* or the *child,* and may occur during the *pregnancy,* the *labor,* or the *puerperium.*

In PREGNANCY the conditions that may affect the *mother* and call for prompt action on the part of the nurse are *eclampsia, syncope, hemorrhage,* and *miscarriage.*

ECLAMPSIA is a most serious complication occurring during the last three months of gestation, and is characterized by general œdema, convulsions, and coma. It must be differentiated from epilepsy and hysteria, and its management by the nurse is fully discussed in Chapter VII.

SYNCOPE is usually an unimportant matter, unless it is due to uræmia, and is often associated with anæmia or hysteria. The patient should be placed on her back, with no pillow under her head; her clothing loosened, especially at the waist, until all constriction is removed; ammonia applied to her nose; and, as soon as she has recovered sufficiently to be able to swallow, whiskey or some other stimulant administered by the mouth. Patients who are subject to attacks of fainting during pregnancy should avoid hot, crowded rooms and every form of excitement, and be under the direct supervision of a physician at all times.

HEMORRHAGE during pregnancy, if occurring only in the first three months and of the menstrual type, is not necessarily of any consequence, but it should be reported to the physician in view of the possibility that it may be one of the early symptoms of ectopic gestation.

Hemorrhage occurring late in pregnancy may be due to placenta prævia, to the accidental detachment of a normally situated placenta, or to the rupture of an ectopic gestation sac. Bleeding due to placenta prævia is termed " unavoidable" hemorrhage, because, from the very nature of the case, it is bound to occur,

sooner or later; while that caused by the accidental separation of a normally situated placenta is called "accidental" hemorrhage, since it need not necessarily have occurred except for the accident that caused the detachment of the placenta from the uterine wall.

Unavoidable hemorrhage (that due to placenta prævia) is always external, and the first symptom of this complication is the sudden gush of bright-red blood unaccompanied by pain and dependent upon no discoverable exciting cause. The mere position of the placenta at or near the internal os uteri is sure to cause bleeding either at or before the beginning of labor.

FIG. 103.—Concealed hemorrhage. The blood has collected between the placenta and the uterine wall, and the patient may bleed to death inside her own body.

Accidental hemorrhage may be either *external* or *concealed,* and is accompanied by severe tearing pain at the site of the placental separation. In the *concealed type* the uterus merely bleeds into itself (Fig. 103), and the condition can only be recognized by the severe pain in the uterus and the general symp-

toms of hemorrhage,—namely, collapse, extreme pallor, feeble, rapid pulse, disturbances of sight and hearing, excessive thirst, and "air hunger."

Hemorrhage due to the *rupture of the sac in ectopic gestation* is always concealed, the blood escaping into the abdominal cavity and the patient suffering from pain of an excruciating character on the affected side, accompanied by collapse and the general symptoms of hemorrhage mentioned in the preceding paragraph. The gestation sac in ectopic pregnancy usually ruptures not later than the fourth month, a period too early for placental separation to occur, and this fact is an important factor in the differential diagnosis between the two conditions.

All that the nurse can do in any case of severe hemorrhage during pregnancy is to send at once for the nearest physician; put the patient in bed, flat on her back, with as little delay or excitement as possible; give a hypodermic injection of morphine (one-sixth grain), repeating it in fifteen minutes if the pain is severe and the hemorrhage not due to placenta prævia; make immediate preparations for an operative delivery, or, if the case is one of ectopic gestation, for an abdominal section; and provide sterile normal salt solution (six-tenths per cent.) in ample quantity for infusion.

It is needless to say that everything must be done in as quiet and methodical a manner as possible, and that no knowledge of the serious nature of the case must be permitted to reach the patient.

Preparations for operation must be made in an adjoining room, and all members of the family who, by their manner, would have a tendency to frighten the patient and arouse her suspicions must be excluded from her presence on some pretext or other.

Miscarriage may occur at any time during pregnancy, either as a result of a blow, fall, or other injury, or from an unknown cause. Any of the acute febrile diseases may cause miscarriage, and this accident is certain to occur if the patient's temperature rises to 105° F. Any pregnant woman suffering from a febrile disease may be expected to miscarry if the tem-

perature rises to the point mentioned, and whenever the nurse sees that the fever is steadily increasing she should make such preparations as will be necessary when the miscarriage occurs.

Miscarriage is seldom if ever accompanied by any *immediate* danger to the patient, although its *remote effects* may be very serious, but the patient is often greatly alarmed at the accident, and the nurse must do all in her power to allay her fears and make her comfortable in mind as well as in body.

The first symptom of miscarriage is pain which greatly resembles that of labor and is often equally severe. This is soon followed by the escape of a bloody discharge from the vagina, and the diagnosis is positive.

The woman should be put to bed at once and given a hypodermic injection of morphine (one-sixth grain), and in some cases this will be enough to check the contractions of the uterus and the case may go on to full term in spite of the threatened interruption. The physician should, of course, be summoned at the first appearance of symptoms, and if the miscarriage occurs in spite of every effort to prevent it, he will usually wish to perform a thorough curettage at once. The preparations for this operation are described in Chapter XXI.

Death of the fœtus during pregnancy is usually followed by miscarriage, and it is only under these circumstances that it can be regarded in the sense of an emergency.

Occasionally the dead infant is retained in the uterus for a considerable period, and when this occurs the diagnosis of the condition is often extremely difficult. The symptoms that point to the death of the fœtus are cessation of fetal heart sounds and active movements, general malaise of the mother, the occasional appearance of a foul-looking, though not necessarily offensive, discharge from the vagina, dull pain in the back and limbs, and shrinking and general flabbiness of the breasts and abdomen.

The physician should be notified if these suggestive symptoms develop, and if he finds, on examination, that the child is actually dead, he will usually proceed to empty the uterus at once.

During labor the mother may suffer from *eclampsia, hemor-*

rhage either from placenta prævia or placental separation, *rupture of the uterus, inversion of the uterus,* and *sudden death* from heart failure or other cause due to intercurrent constitutional disease.

ECLAMPSIA and HEMORRHAGE have already been sufficiently discussed, and as the physician will usually be in attendance at this time, the nurse will be relieved of all responsibility.

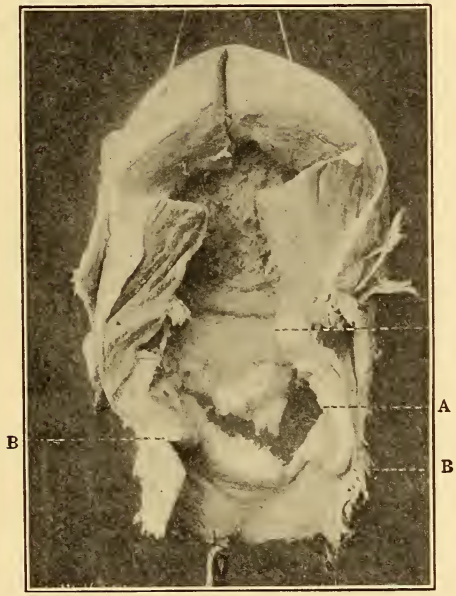


FIG. 104.—Rupture of the uterus. The specimen is opened opposite the laceration in its wall (A), and the points (B B) indicate the ends of the severed cervical ring. The roughened area of placental attachment is plainly seen at the upper part of the uterine cavity.

RUPTURE OF THE UTERUS (Fig. 104) often resembles greatly the concealed hemorrhage of placental separation, the general symptoms of shock and collapse being common to both conditions, but the essential difference is that placental detachment occurs before or early in labor, while rupture of the uterus can only happen after the woman has been in severe labor for a considerable time. If the fœtus escapes through the tear into the

abdominal cavity, Cæsarean section will be necessary for its removal, while if it can be delivered through the natural passages by forceps or version, the surgeon may either open the abdomen and sew up the rent, or pack the uterine cavity through the vagina with gauze and leave the healing of the wound to nature. As the treatment by packing gives, in the general run of cases, as satisfactory results as the more radical abdominal operation, it is the one most commonly employed.

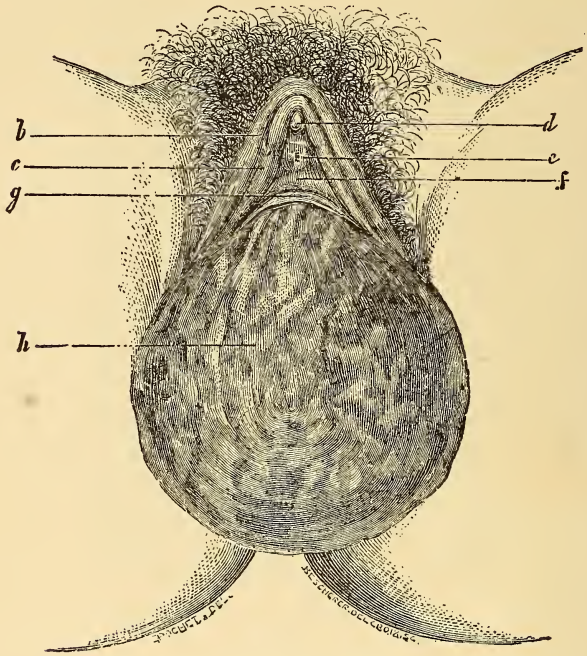


FIG. 105.—Complete inversion of the uterus. (Boivin and Dugès.) *b*, right labium majus; *c*, right labium minus; *d*, clitoris; *e*, meatus; *f*, anterior vaginal wall; *g*, external os uteri; *h*, internal surface of inverted uterus.

INVERSION OF THE UTERUS is one of the rarest accidents of labor, but it may occur in any degree, from a mere sinking down of the fundus to an actual turning inside out of the entire organ (Fig. 105). It may follow operative delivery, or it may be due to shortness of the umbilical cord, either actual, or rela-

tive by being wrapped about the infant's body, which drags down the placenta and with it the adherent uterine wall.

After the child is born, inversion may be caused by pulling on the umbilical cord to extract the placenta, or, if the uterus is empty and relaxed, by improper pressure on the fundus or violent straining or coughing by the mother. These last-mentioned cases might better be classed as accidents of the puerperium, but the complication is of such extreme rarity at any time that it need only be mentioned in this place.

The *symptoms* are severe pain at the point of inversion, hemorrhage which is more severe as the inversion is greater, faintness or actual syncope, collapse, and pain in the rectum and bladder.

The *treatment* consists in replacing the inverted portion of the womb, and is easier the more promptly it is performed. It cannot be attempted by the nurse.

HEART FAILURE and other conditions of a like nature which greatly endanger the patient can, in the absence of the physician, only be treated by the prompt and energetic administration of stimulants, such as whiskey, strychnine, and nitroglycerin, by the hypodermic needle.

THE CHILD may be endangered during labor by *malposition, prolapse of the umbilical cord,* and *asphyxia* from protracted or instrumental delivery. The only *malpositions* which the nurse can be expected to recognize are those accompanied by prolapse of an arm or leg, but if she finds an extremity protruding from the vagina she will, of course, know at once that the case is a serious one and send immediately for the physician.

If the CORD PROLAPSES and descends in front of the presenting part (Fig. 106), the accident is usually due to premature rupture of the membranes when the head or breech is not sufficiently down in the pelvis to prevent the cord from being washed past it in the sudden gush of amniotic fluid. Unless the cord is carried down to the vulvar orifice, the nurse is not likely to know that this complication has arisen, for in private practice she is not expected to make any vaginal examinations

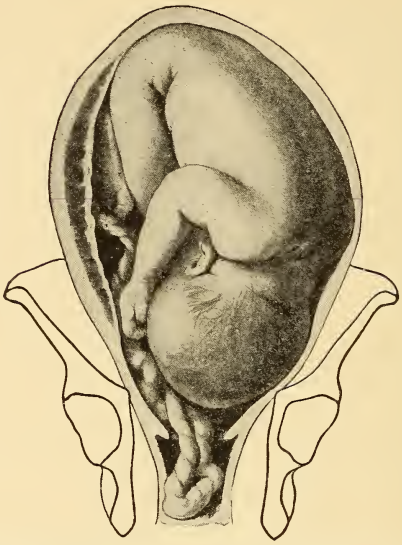


FIG. 106.—Prolapse of the umbilical cord. (Bumm.) As the head comes down the compression of the cord between the fetal skull and the pelvic brim will shut off its circulation completely.

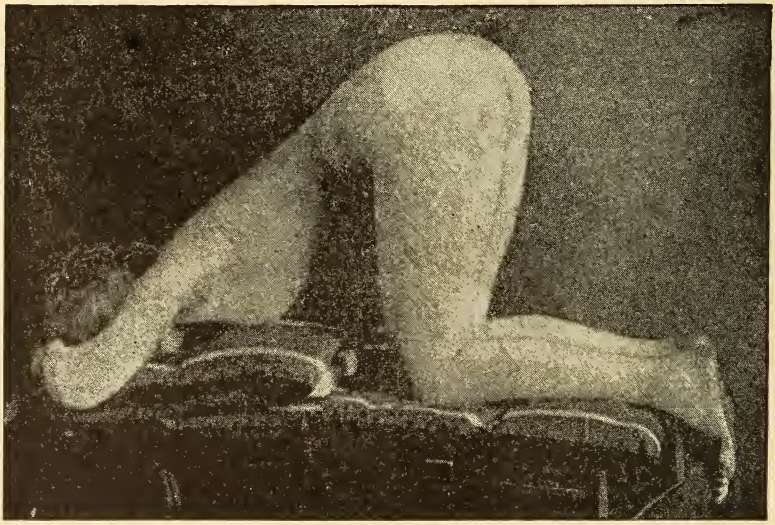


FIG. 107.—Knee-chest position. (Potter). The back must be straight or slightly concave and the thighs perpendicular.

whatever, except for special reasons of the utmost urgency. If, however, she knows that the cord has prolapsed, she should send at once for the physician and then put the patient in the "knee-chest" position (Fig. 107), or in the Trendelenburg posi-

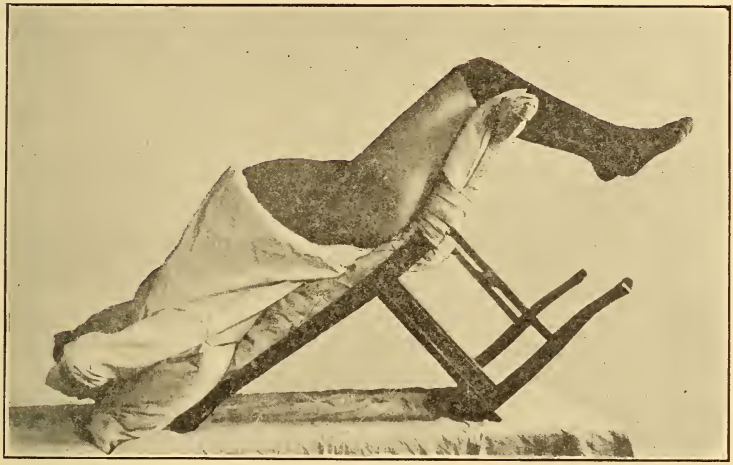


FIG. 108.—Trendelenburg position.

tion (Fig. 108), to favor its return into the cavity of the uterus. If the pulsations in the cord cease or even grow feeble or irregular, there can be no objection to an attempt at its reposition with the hand.

With the patient in one or the other of the positions named, the nurse should pass her entire hand, thoroughly scrubbed and disinfected and well lubricated with sterile vaseline or lubrichondrin, into the vagina and try, with the utmost gentleness, to push the cord up into the uterus past the presenting part until it falls entirely out of reach. This is often a very difficult thing to do, on account of the tendency of the cord to prolapse as soon and as often as it is replaced, but if the nurse has been thorough in the disinfection of her hands and in her observance of all the rules of asepsis no harm can result from the attempt, and it may be the means of saving the infant's life. The patient's

hips must be kept raised above the level of her shoulders, or the cord will be almost certain to come down again into the vagina, and this can best be accomplished by placing a thick pillow or cushion under her buttocks, for it will be found quite impossible for her to remain in either the "knee-chest" or the Trendelenburg position for any length of time. In changing to the dorsal posture the patient must exercise the greatest caution, and the pillow or cushion must be ready to place under her the moment she is on her back. As soon as this change in position has been accomplished the nurse should, with every antiseptic precaution, again insert her hand into the vagina to make sure that the cord has remained above the pelvic brim.

It is, of course, assumed that every effort has been made to secure the services of some physician, even other than the regular medical attendant, before any manual correction of this condition has been attempted by the nurse. If a physician can be secured within a reasonable length of time nothing should be done by the nurse beyond putting the patient in the "knee-chest" or the Trendelenburg position and awaiting his arrival.

Asphyxia neonatorum (asphyxia of newly born infants) may result from injury during manual or instrumental delivery; from compression or torsion of the umbilical cord, shutting off the fetal blood-current; or from protracted labor alone. Any one of these conditions should be enough to suggest the probability that the child will be born in a state of suspended animation, and preparations for its resuscitation should be made, if possible, before the termination of the labor, so that there will be no delay whatever.

The nurse should have ready two large pans or foot-tubs, one containing hot water (105° F.) and the other ice-water and a good sized piece of ice. These should be placed side by side on chairs or on a low table at a distance from the mother's bed, or even in another room. In addition there should be a soft rubber catheter, about the size of a lead-pencil, for withdrawing mucus from the infant's throat, and a number of pieces of gauze, about eight inches square, for wiping out the mouth

or for placing over the face if it is deemed necessary to blow air directly into the baby's lungs.

There are two types of asphyxia neonatorum. In one the baby's face and even its entire body are of a livid hue and the vessels of the umbilical cord are gorged with blood; in the other the child's face and body are of a death-like pallor and the vessels of the cord are empty.

The *livid* cases usually recover, for the lividity only indicates an early stage of asphyxiation, but while the *pallid* infants may occasionally be made to breathe after prolonged efforts, the majority of them die at once or after a few days.

If a child is born in an asphyxiated condition the cord should be tied and cut at once, so that there will be no interference with the performance of artificial respiration and to permit the adoption of immediate measures towards its resuscitation.

No time is to be wasted in determining whether it is dead or alive. *It is always to be assumed that the child is living,* for often it is over an hour before breathing can be established, and cases are on record where success has followed efforts extending over the enormous period of seven or eight hours. Moreover, even if the child is dead, it is a satisfaction and comfort to its parents to know that every possible effort was made to save it.

There are many methods of performing artificial respiration on the newly born infant, but a description of one and its clear understanding by the nurse is all that is necessary in this place.

The first thing to do is to hold the infant up by its heels (see Fig. 64), slap it sharply on its back and chest, and insert a finger in its mouth to the back of its throat and remove any mucus or blood that may be there.

The child should next be dipped up to its neck in the hot water, held there for a moment or two, then transferred to the cold water for an instant, and back to the hot. While it is still in the hot water artificial respiration should be practised in the following manner:

The child is held with the right hand of the nurse under its shoulders and its neck lying in the cleft between the thumb

and forefinger, with the head falling loosely backward. The left hand of the nurse supports its thighs, and its entire body, with the exception of its head, is submerged in the hot water. This means, of course, that the nurse's hands are both under water.

Expiration is now affected by doubling up the body of the infant until its knees almost if not quite touch its chest. It is held a moment in this position, and then *inspiration* is caused by separating the hands and bending the body backward as far as possible. This process is repeated about twelve times a minute, or once in every five seconds, and by placing her ear close to the baby's mouth when the movement of expiration is performed the nurse can tell if the manipulation is effective and air is actually being forced in and out of the lungs. Every few minutes the child is to be plunged into the cold water and returned instantly to the hot, in the hope that the shock will stimulate natural respiratory movements of the chest, and from time to time a finger is to be passed into its mouth to free it from mucus or other obstructing substance.

If its heart action is very feeble or irregular, or if no beats at all can be heard by placing the ear in close contact with the chest wall, a hypodermic injection of whiskey (ten minims) should be given, and if no air can be made to enter and leave the lungs when the artificial respiration is performed the air-passages may be expanded by laying a piece of gauze over the infant's face and, with the lips in close contact with its mouth, blowing a short, sharp blast down its throat. As soon as this has been done the artificial respiration is to be resumed and continued for at least an hour in the manner already described.

If at the end of this time there are still no signs of life, it is hardly probable that anything further can be accomplished, but it is usually wiser to continue the efforts for a somewhat longer period, if for no other reason that to satisfy the family.

The physician will, of course, attend to this matter of resuscitating the infant if the condition of the mother is such that he can leave her with safety, but often the task will fall to the

nurse, and in some cases, even after the physician has officially pronounced the child dead, the family will be gratified at further efforts to save it, futile though they be.

DURING THE PUERPERIUM the conditions affecting the mother which can be classed as accidents and emergencies are *eclampsia, retained placenta, hemorrhage,* and *embolism,* or "heart clot."

ECLAMPSIA has already been fully discussed, but it must be remembered that when this complication *originates* after the birth of the child it is of a far more serious nature than when it occurs before or during labor. Under the latter circumstances it may usually be relieved by the prompt emptying of the uterus, but when the convulsions appear for the first time after the child is born it shows that the constitutional poisoning is of an exceptionally virulent type, and there is nothing to do beyond controlling the convulsions with chloroform and fighting the attack in the manner described in Chapter VII.

The nurse will, of course, summon the physician at once if eclamptic convulsions appear, and she must be on her guard that the spasms are not due to excessive hemorrhage. There should be no difficulty whatever in distinguishing between the two conditions, for the convulsions due to hemorrhage do not appear until the body is practically bloodless and just before death supervenes, while in eclampsia the patient's face is flushed or even cyanotic and the pulse is full and hard.

RETAINED PLACENTA is not a serious condition unless the presence of the after-birth in the uterus prevents firm contraction of the womb and causes severe hemorrhage. Even in these cases there is usually time to await the arrival of the physician, for it is assumed that he was summoned at the onset of labor, and it is not to be supposed that he will leave before the placenta is delivered. Firm pressure is to be maintained on the fundus, which is to be kneaded vigorously whenever it shows signs of relaxation, and it is hardly probable that enough blood will be lost to affect the patient seriously. If the bleeding becomes alarming, as shown by the amount of the flow and the general condition of the patient, and no physician can be secured, the nurse may, after the most careful disinfection of her hand, pass

it gently into the vagina up to the cervix, grasp the placenta firmly in her fingers and remove it slowly and with a deliberate twisting motion (Fig. 109). If it is still adherent to part of the

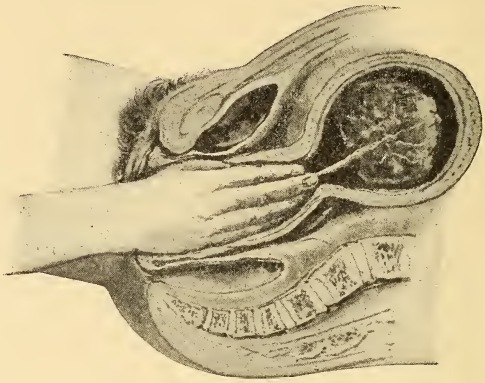


FIG. 109.—Manual extraction of the placenta. (Garrigues.) This must never be attempted by the nurse, except for urgent reasons and after most careful aseptic precautions.

uterine wall, two or three fingers are to be carried into the womb, between it and the placenta, and the tissues separated much as one would separate the sections of an orange. When the entire organ has been detached in this way, it is to be grasped in the palm of the hand and withdrawn carefully. If all antiseptic precautions have been faithfully observed this manœuvre will do no harm, but it must be distinctly understood that it is a dangerous thing to do, and one never to be attempted by the nurse except in the gravest emergency when no physician at all can be obtained.

HEMORRHAGE other than the type just mentioned may be due to laceration of the cervix or to uterine inertia.

HEMORRHAGE due to *cervical laceration* is almost invariably caused by instrumental or manual delivery, and seldom if ever by spontaneous labor. The bleeding appears the instant the child is extracted from the vagina, and in rare instances may be of sufficient severity to greatly endanger the mother. If the fundus is firm and well contracted and the blood continues to flow freely, the diagnosis is very simple.

Fortunately for the nurse, the physician is usually present when this accident occurs, and the management of the case rests entirely with him. Occasionally it is necessary to bring the torn edges of the cervix together with one or two chromicized catgut sutures in order to check the bleeding, but in many cases snug packing of the vagina with gauze will be found effectual.

Whether the cervix is to be sutured or the vagina merely packed, the patient should be turned crosswise in the bed with her buttocks well over the edge and her legs supported in the lithotomy position, either in a leg holder or by assistants.

If packing is the method of treatment employed, the nurse must watch the fundus with special care during the next few hours, lest hemorrhage continue into the cavity of the uterus. The packing should never be left in the vagina for more than twenty-four hours, and in many cases it is better to remove it at the end of twelve hours, as it almost invariably interferes with natural urination and makes catheterization extremely difficult.

If the hemorrhage has been at all severe the nurse should prepare hot (118° F.) sterile normal salt solution (one teaspoonful to the quart) for infusion, arrange for elevating the foot of the bed, and provide an ample number of hot-water bottles (beer-bottles with patent stoppers in an emergency) with which to surround the patient.

Post-partum hemorrhage, in the ordinary acceptance of the term, is that which occurs from the cavity of the uterus after the birth of the child and either before or after the delivery of the placenta. It is due in almost every case to relaxation of the uterus (uterine inertia), and may usually be prevented if proper attention is paid to the management of the fundus during the hour that immediately follows the delivery of the infant.

It is apt to occur in severe cases of albuminuria or other constitutional disturbance; it frequently follows operative delivery or prolonged and exhausting natural labor; and it may occur in any case from no discoverable cause, unless it be carelessness in holding the fundus. Consequently, the occurrence

of post-partum hemorrhage is to be regarded as a possibility after every case of labor, no matter how simple and normal its course may have been, and, as Dr. Gooch has said, "No physician should have the assurance or hardihood to cross the threshold of a lying-in chamber who is not thoroughly conversant with the remedies for flooding."

Unfortunately, there are many physicians who, although they may be as "thoroughly conversant with the remedies for flooding" as Dr. Gooch in his most exacting mood could desire, neglect systematically to provide themselves with the necessary drugs and appliances to meet this condition effectively. Nearly every case of post-partum hemorrhage that passes beyond control may be accounted for by the neglect of some one to have ready the necessary articles for checking it at its very outset, and it may safely be said that there is no variety of hemorrhage that should be so amenable to the surgeon's skill as the one under consideration.

The physician who attends obstetric cases with no other equipment than a vial of ergot, a bichloride tablet, and a pair of forceps in a little black bag is rapidly being relegated to the obscurity which he deserves, and his disappearance from society will be of untold benefit to the mothers of the future.

Post-partum hemorrhage is usually external, or largely so, but when it occurs before the delivery of the placenta it may, in good part, be concealed within the cavity of the uterus. The concealed type can never occur if the fundus is properly held, for the blood will necessarily be squeezed out of the womb into the vagina and escape into the bed.

When, however, the uterine tissue is so inert that, although it may be compressed and the walls of the womb approximated by the pressure on the fundus, the muscular fibres refuse to contract and close the blood-vessels, the condition is a most alarming one, and in severe cases may cause death within a few minutes.

As a rule, if hemorrhage does not occur within an hour after the birth of the child, especially when the fundus has been properly managed, it will not occur at all, but it may develop

twenty-four hours or even longer after delivery, and the nurse will be called upon to meet the emergency without a moment's delay.

In cases which occur before the departure of the physician he will usually pack the uterus firmly with strips of iodoform (five per cent.) or sterile gauze, if the administration of ergot, vigorous kneading of the fundus, and a hot (120° F.) sterile or saline douche do not check the flooding at once. Every physician should have gauze for tamponing the uterus in his maternity outfit, and the nurse should have ready, at every labor, a sufficient quantity of hot sterile water or saline solution for use at a moment's notice.

The patient is to be brought to the edge of the bed, in the lithotomy position, and if the physician decides to pack the uterus he will grasp the anterior lip of the cervix with a volsellum or bullet-forceps (Fig. 131), draw it down to the vulva, and have the nurse steady it in this position while he inserts the gauze. Hot salt solution for infusion or rectal irrigation must be provided at once, the patient laid flat on her back, without a pillow, and surrounded with hot-water bottles, the foot of the bed elevated, and hot water with whiskey or brandy given by the mouth unless there is vomiting.

If hemorrhage occurs when the nurse is alone, she should, of course, send at once for the first physician that can be reached.

In many cases her attention will be directed to the condition by the patient herself, who will complain that she is "flooding," and inspection will show a pool of blood (possibly a pint or more) in the bed. At other times the suspicions of the nurse will be aroused by the pallor of the patient's face, and on raising the bedclothes the evidences of severe bleeding will be found as before.

The first thing to do, after sending a messenger hastily for the nearest physician, is to grasp the fundus, if it can be found, and knead it energetically. If ergot is to be had, some one should be directed to give the patient a teaspoonful by the mouth. If the nurse has equipped herself according to the directions

given in Chapter X., she will have tablets of ergotin in her outfit, and, instead of the fluid preparation, two grains of ergotin dissolved in one drachm of water may be injected hypodermically into the outer side of the thigh. The vigorous rubbing of the fundus is to be kept up while some one is despatched for hot water and salt, and if a piece of ice can be secured promptly, it may be rubbed briskly over the belly to stimulate uterine contraction while awaiting the arrival of the hot water.

As soon as the materials for the douche are at hand the water is to be brought to the temperature of 120° F. (or as hot as the hand can bear) by the addition of cold if necessary, a teaspoonful of salt added to each quart, and the solution injected freely into the uterus, while the hand on the abdomen still exerts pressure on the fundus.

If, in spite of this, the uterus remains flabby and the bleeding continues to an excessive degree, the nurse should take a clean handkerchief or napkin (preferably a new one), if no gauze is available, soak it in vinegar, and thrust it boldly through the vagina into the uterus and up to the fundus. While the hand is in the uterus a rapid search should be made for any possible fragments of retained placenta, and if any are found they must be removed, as well as all blood-clots, so that the cavity of the womb shall be entirely empty. The cloth soaked in vinegar is to be left in the uterus only long enough to stimulate strong contractions, when it is to be removed carefully, together with all clots and placental tissue that may be present.

If this manœuvre fails and no physician has arrived, and if the condition of the patient continues to grow more and more alarming, the only remaining hope is to pack the uterus.

The nurse cannot be expected to do this as expeditiously or as effectively as the physician, but if she has in her the stuff that heroines are made of, and keeps cool and collected, she may, in a desperate case, be the means of saving a life that would otherwise inevitably be lost. She will not have proper materials for packing nor instruments for the introduction of the tampon, but there is no time to be lost and she will have to do the best she can. If she has plain gauze, well and good;

if not, she must use a clean sheet; either of which is to be torn in strips three inches wide and as long as the material will allow. A gauze bandage of this width makes good packing material, and occasionally can be secured on short notice.

While some one presses the fundus down so that the cervix will appear at the vulva, the nurse can, with her hand, force the gauze into the uterus in loops of about six inches at a time until the cavity is entirely filled, after which the vagina is to be packed with equal firmness.

It will be noticed that nothing has been said about antiseptic precautions of any kind. It is, of course, assumed that the rules of surgical cleanliness will be followed as far as the circumstances will permit, but in those cases where the question of life or death must be decided within a very few minutes the hemorrhage must first be controlled at any cost and the septic infection, if it occurs, combated afterwards.

As soon as the uterus and vagina are packed the patient is to be placed on her back with no pillow, surrounded with hot-water bottles, and the foot of her bed elevated. A quart of hot salt solution (118° F.) is to be injected slowly into her rectum, as high up as possible, to be absorbed and take the place of the blood lost, and this may be repeated every half-hour if necessary.

Stimulation, in the form of whiskey, one drachm, strychnine, one-sixtieth grain, or nitroglycerin, one one-hundredth grain, necessary to bandage the arms and legs snugly from below is to be given hypodermically as indicated, and it may be upward to force the blood out of the extremities into the trunk. These bandages should never be allowed to remain for more than two hours, and they are to be removed with great caution, one at a time, to avoid the danger of collapse.

If the patient still fails to respond to treatment, subcutaneous infusion of normal salt solution should be performed as follows: A pint of the solution, at a temperature of 100° F., is placed in an ordinary douche-bag or fountain syringe and hung about three feet above the level of the patient's body. An ordinary hypodermic needle (the larger the better, and, best of all, an aspirating needle, Fig. 110) is attached to the end of the tubing,

and as soon as the liquid begins to flow the needle is thrust for its entire length into the chest at the base of the breast, parallel

FIG. 110.—Aspirating Needle.

to the surface of the body (Fig. 111). Gentle massage should be practised as the solution distends the tissues, and the needle should be moved about from time to time and occasionally with-

FIG. 111.—Saline infusion under the breast. The bag should hang three feet above the level of the bed or table.

drawn and inserted in a new place. The time required for the infusion of a pint of solution in this manner will be from ten to twenty minutes according to the size of the needle, and fresh

hot solution should be added at occasional intervals to keep the temperature up to the required point (100°).

It is needless to say that the apparatus and the solution must be sterile, and the skin at the site of the infusion is to be wiped off with alcohol or some antiseptic preparation.

The method of treatment outlined here is carried to completion to cover those cases in which no physician at all can be secured, *but the nurse must exert every effort to obtain the services of some medical man at the earliest possible moment who will take charge of the case and relieve her of any further responsibility.*

Although a condition that is preventable in almost every properly managed case, post-partum hemorrhage is one of the most terrible complications that can arise in any branch of surgery, and the nurse who can, by her own efforts, bring a patient out of this emergency is worthy of all honor and respect.

Embolism, or "heart clot," may be formed originally in the right ventricle, or may be due to a thrombus washed along in the blood-current until it is lodged in the heart. The clot obstructs the passage of blood into the lungs, either wholly or in part, and the patient may die of asphyxia within a few minutes.

The condition may follow severe hemorrhage, septic infection, shock, or general exhaustion, and may occur at any time during the puerperium.

The entrance of air into the circulation through the uterine vessels, either from the careless administration of a douche or from the decomposition of septic matter within the womb, presents practically the same symptoms and calls for the same treatment as heart clot.

The *symptoms* are sudden, severe pain over the heart, great dyspnœa, syncope, feeble, irregular pulse, or none at all, pallor in some cases and cyanosis in others, and death at any time within a few minutes to a few hours, according to the amount of obstruction to the pulmonary circulation. Very few cases recover.

The *treatment* consists, first, in preventing the accident by careful attention to all the details in the proper management of

every obstetric case, and secondly, if the complication arises, in the free administration of whiskey and strychnine and the maintenance of absolute quiet on the back, for the slightest movement may result fatally.

If the patient survives the attack, the body temperature must be kept up by the use of hot-water bottles, absolute rest enjoined, and a light, nourishing diet given, in the hope that she can be kept alive until the clot is absorbed.

The only obstetric emergency that can affect the *child* after its birth is *secondary hemorrhage from the navel or cord.*

If the blood escapes through the vessels of the cord before it has separated from the body, a fresh ligature is to be applied and tied tightly and carefully.

If the blood comes from the navel itself at the base of the cord, either before or after its separation, it can usually be controlled by firm pressure with hot compresses (110° F.) until the arrival of the physician. The treatment which he will probably adopt if the hemorrhage is severe and continues for a long time is to transfix the base of the navel with two long needles inserted at right angles to each other and compress the vessels against them with a tight "figure-of-eight" ligature.

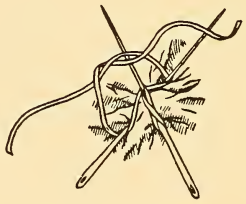


FIG 112.—Figure-of-eight ligature. For controlling secondary hemorrhage from the umbilicus.

In rare cases, where no physician can be secured, the nurse may have to do this herself. Every antiseptic precaution is to be faithfully observed, and the needles (darning needles will answer) and silk or bobbin tape must be boiled.

The navel is to be pinched up with the thumb and forefinger and a needle thrust through its base from side to side at a

depth of about one quarter of an inch. The second needle is then to be inserted in the same manner, at right angles to the first, and the ligature passed tightly over the ends in "figure-of-eight" loops and drawn up until every vestige of bleeding, or even oozing, has ceased (Fig. 112). The needles may be removed at the end of six or eight hours, but the ligature should be allowed to remain and come off when it will.

The dressings should be changed daily and the most rigid antiseptic precautions must be observed until the parts are entirely well.

XVIII

The Physiology of the Puerperium

THE PUERPERIUM, also called the *"puerperal state"* and the *"lying-in state,"* is practically a period of convalescence extending from the end of the third stage of labor to the time when the patient has fully recovered from its effects. While, in normal cases, it cannot properly be called a pathological condition, it is so nearly on the border line between health and disease that it must be most carefully watched lest serious complications develop suddenly and unexpectedly.

Immediately after labor the patient experiences a sense of exhaustion, which is soon followed by a feeling of delightful comfort and repose. Her child is born, her sufferings have ceased, and she usually passes from a state of perfect contentment into drowsiness, and finally into sound and natural sleep.

Every effort should be made to encourage this state of affairs, and the necessary toilet of the patient and arrangement of the room must be made as quietly and expeditiously as possible, while all visitors, except possibly the husband and mother, are to be rigidly excluded.

A chill occurring *immediately* after labor, and due partly to a disturbance of equilibrium between external and internal temperature, caused by the excessive perspiration in the stage of greatest muscular exertion, and partly to the sudden removal of a large mass of tissue from the abdominal cavity, is not of infrequent occurrence and has no unfavorable significance. A warm bed, hot-water bottles, and a drink of warm tea are all that is needed to control it effectually.

The *pulse* of the puerperal woman should show a marked drop in frequency, due probably to greatly lessened arterial tension. It usually goes down to about 60, and even a fall to 40 beats per minute is not uncommon. This is always a favorable symptom, while a rapid pulse after labor is to be regarded with

suspicion as an indication of shock or possibly of concealed hemorrhage.

The *temperature* of the lying-in woman usually rises slightly, and while 100.5° F. is generally regarded as the limit in normal cases, it cannot be denied that patients occasionally show a somewhat higher temperature without any ill effects. In judging of the significance of the temperature the pulse is the best guide, for a puerperal patient with a slow pulse is not likely to do badly even if her temperature is a little high. Nevertheless, the nurse should report at once to the physician a temperature of over 100.5° F. or a pulse of over 100, and such a patient must be watched most carefully for the possible development of further unfavorable symptoms.

The *uterus* begins to return to its normal condition with the beginning of labor. This process is called "*involution,*" and consists partly in the contraction of the womb and partly in the destruction of certain of its tissues, which are carried away not only in the discharge of blood and serum that follows later, but by means of the general circulation as well. The normal process of involution requires about six weeks, and at the end of that time the uterus should be, as nearly as it ever will be, in the condition it was in before pregnancy occurred. It never returns to exactly the virgin state, but may approach it very closely if there have been no lacerations of the cervix.

Involution is favored and hastened by everything that tends to make the puerperium perfectly normal, and is delayed by the opposite condition. It is on this account that breast-feeding of the infant is urged in the interest of the mother, for the reflex connection between the breasts and the uterus is so well established that the irritation of the nipple in nursing acts as a powerful stimulus to uterine contractions.

"*Subinvolution*" is the term used to describe the condition which exists when involution is not complete at the time when it should be. It is a chronic condition, characterized by a large and flabby uterus usually more or less chronically congested, and causes the patient much discomfort and disturbance of health until it is cured.

The *vaginal walls,* the vulva, and all other tissues that have become hypertrophied during pregnancy also undergo a process of involution in their return to their normal condition, and the abrasions and lacerations of the genital canal caused by the passage of the fœtus heal completely during the puerperium.

Lochia is the name given to the discharges that come from the uterus and vagina for about three weeks after the birth of the child. At first the discharge consists almost entirely of blood, which escapes from the placental site on the uterine wall, mixed with a small amount of mucus and particles of decidua. This is known as "lochia rubra" (red lochia) and lasts about three days, when it gradually changes to a pinkish color due to the admixture of a considerable amount of serum from the healing surfaces. Towards the eighth or ninth day the lochia become thinner, less in amount, and of a greenish-yellow color, and by the end of the third week the discharge usually disappears entirely.

The lochia should never, at any time, have an offensive odor, although it possesses a peculiar animal emanation which is quite characteristic.

Premature suppression of the lochial discharge may be caused by cold, fright, grief, or other emotion, and is usually dependent upon a relaxed condition of the uterus.

Late return of blood in the discharge, after it has once disappeared, often occurs when the patient gets up too soon, and is not of any serious import if she returns to her bed for a few days longer.

"*After-pains*" are painful contractions of the womb occurring after labor and due to its efforts to expel a blood-clot which has formed within it when it was in a state of relaxation. After-pains are more common in women whose tissues are soft and flabby, and so are seen less frequently in primiparæ than in those who have borne many children. They occur at intervals, like labor-pains, and often are said by the patient to cause her more suffering than the labor-pains themselves. The proper management of the fundus uteri, as described in the next chapter, will insure firm and permanent contraction, and is the best preventive

against after-pains. When they are at all severe they interfere markedly with the patient's rest and comfort, and the physician will usually find it necessary to remove the clot from the uterus to effect a cure. Under ordinary circumstances they will disappear spontaneously about the fourth day.

Retention of urine is not uncommon during the first two or three days after labor, owing to the swollen condition of the urethra and the tissues surrounding it. Its treatment is discussed in the following chapter.

Constipation after labor is the rule rather than the exception, because of the relaxed and flabby condition of the intestinal and abdominal muscles and the inability of many persons to empty the bowels while in the dorsal position on the bed-pan. As the rectum has been, or should have been, emptied by enema at the beginning of labor, nothing further is needed until about two days have elapsed, when the physician usually orders a simple cathartic. If he neglects to do so it is proper for the nurse to remind him that the bowels have not moved, rather than take the responsibility of giving drugs on her own account.

The *appetite* of the patient is usually somewhat diminished during the early part of the puerperium, and this, combined with the fact that all of her excretions are markedly increased, causes her to lose flesh to the amount of from nine to twelve pounds before she begins to gain in weight.

"Milk fever" is a term occasionally and, possibly, incorrectly used to describe a slight and unimportant rise of temperature that occurs about the third day and subsides in a few hours. This was long supposed to be due to the development of milk in the breasts, which occurs at the same time, but it is now thought by many to depend entirely on a very slight infection due to the unavoidable introduction of a few bacteria into the genital tract. The author believes, however, that the mere discomfort, due to tension in the early days of lactation, is not infrequently responsible for this phenomenon, independently of any infection whatever. It is quite a regular occurrence, and should never last more than a day.

XIX

The Management of the Puerperium

The fundus uteri is to be held through the abdominal wall for one full hour after the birth of the child. This duty may be performed by the physician or he may delegate it to the nurse, but it must never be forgotten that it is of far greater importance than anything else that can be done at this time, and the nurse should never begin to put the room in order, bathe the patient, or wash the baby unless some one has a hand on the fundus. If this procedure were conscientiously and systematically followed out in every case, post-partum hemorrhage due to uterine inertia would be practically unknown.

The nurse should sit or stand by the side of the patient, facing her feet, and the ulnar edge (the edge on the side of the little finger) of the hand nearest the patient is to be pressed down firmly on the abdominal wall in the median line and at a point at about the level of the umbilicus (Fig. 113). In the relaxed and flabby condition of the abdominal wall after the birth of the child it is quite possible to force it back until the backbone can be felt, and the nurse never should make the mistake of not using sufficient pressure. The uterus should now be felt below, and practically in the palm of the hand, as a firm rounded mass about the size and shape of a large cocoanut. If the nurse does not find it at once she should feel around for it, for it may be displaced to one side or it may have relaxed until it has lost its firmness. If this rapid search fails to locate the fundus, she should call at once for the assistance of the physician, or, if she is alone, redouble her efforts, watch for hemorrhage as indicated either by the flow or by the patient's pulse and expression of countenance (pallor, etc.), and have some one give the woman one teaspoonful of fluid extract of ergot if it is to be had. The nurse herself should not remove her hand from the abdomen, and the vigorous kneading of the belly caused by her efforts

to find the fundus, especially if assisted by the ergot, will usually be enough to make the uterus again contract firmly so that it can be distinctly felt under the hand.

As long as it remains firm and hard it should be left alone, the hand resting against it with sufficient pressure to permit the immediate recognition of any tendency towards relaxation.

FIG. 113.—Holding the fundus after delivery. This must be kept up for one full hour after the birth of the child.

From time to time this relaxation will occur and the uterus grow soft and slightly flabby, but still perfectly distinct to the touch. On these occasions the fundus should be grasped in the hand and "kneaded" with a rotary motion gently but with increasing force until firm contraction occurs and the uterus is again hard and solid. This manœuvre is not at all unlike that often practised by patronizing adults when they grasp a small boy by the top of his head and while rumpling his hair in a most uncomfortable manner, and digging their finger-tips into his scalp, ask him, solicitously, what he is going to "be" when he is a man.

As has been said, this attention to the fundus is to be kept

up for one full hour after the birth of the child, by the end of which time the uterus will, in normal cases, have contracted firmly and permanently, and any further danger from hemorrhage will be very remote.

If, however, at the end of the hour the uterus is still relaxed and soft, and cannot be made to stay firmly contracted, the holding and kneading must be kept up until permanent contraction takes place. If the delay is longer than two hours, it would be safer to notify the physician, even though the woman's general condition seemed to be good.

As a rule, the physician prefers to attend to the fundus himself for at least the first fifteen or twenty minutes, and this gives the nurse an opportunity to attend to the next most important duty of the moment, which consists in "cleaning up" the bed and patient and making things as comfortable as possible. The worst of the blood and discharges should first be washed off with a towel dipped in warm bichloride solution (1 to 1000). Next, the Kelly pad and everything under the patient are to be slipped out and into the pail at the side of the bed. A clean towel is now placed under the patient, a vulva pad applied temporarily, and she is covered with a clean sheet. The pail containing the Kelly pad and all soiled towels and other articles that may have been thrown in it or dropped on the floor is removed from the room, and already the most unpleasant features of the labor are out of sight.

If the patient's night-gown has become soiled, it should be removed by cutting it down the middle in front and taking it off like a coat, for an attempt to bring it over the head will usually result most unpleasantly. If the patient objects particularly to having it torn, it may be slipped off the shoulders, rolled down under the buttocks, and taken off over the feet, but the best and simplest plan is to tear it. As soon as it is removed a fresh warm one should be slipped over the head, on to the arms, and drawn down in front to cover the chest, but the back part of the garment is best left in a roll or soft pile under the shoulders or neck to avoid the possibility of its being soiled before the patient's back has been bathed.

In like manner, if there are any stains of blood or other matter on the stockings, they should be removed and fresh, warm ones put on.

The nurse should now prepare a warm solution of Tincture of green soap and, with fresh pieces of absorbent cotton carefully wash off any blood or other matter that may be on the abdomen or thighs, drying the parts immediately with a clean, soft towel. When this is done, the patient is carefully turned on one side and the process is repeated on the back, buttocks, and backs of the legs. It may be necessary to turn the patient first to one side and then to the other for this purpose, and as the towel under her will by this time be soaked with blood, it is to be removed and a clean one put in its place, as well as a clean pad over the vulva.

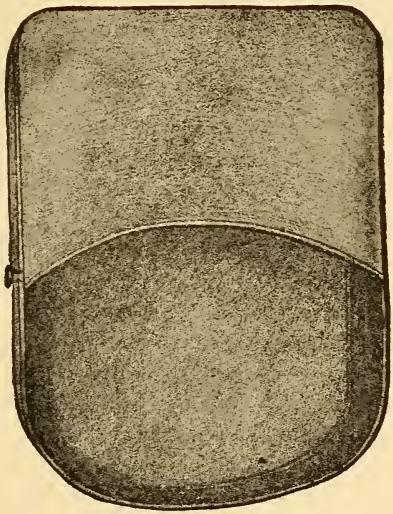


FIG. 114.—Douche-pan.

The patient is now returned to her back and preparations are made for cleansing the external genitals. Fresh green soap solution should be made up with warm boiled water, and the nurse is to disinfect her hands by scrubbing for five minutes

with soap and hot water and soaking for three minutes in bichloride (1 to 2000).

If the patient is in good condition a sterile douche-pan (Fig. 114), covered with a towel, should be placed under her, and the nurse should attend to this and to the preparation of her solutions and cotton sponges before beginning to disinfect her hands.

When everything is ready the person holding the fundus will draw the covering sheet out of the way, and the patient is told to draw up her knees and separate them as far as possible. The hair covering the mons veneris and vulva will be found matted together with clotted blood, and if it is at all abundant the greater part should be carefully cut away with scissors. The parts are then to be bathed with the utmost gentleness with the warm solution until every vestige of blood is removed and the parts are perfectly clean. The douche-pan is now removed and a fresh vulva pad applied to take up the little stream of fresh blood that constantly trickles down over the perineum.

If the patient has been confined on a cot, the next step is to remove her to her bed. The bed should be warmed, except, of course, in summer, and on the draw-sheet is to be laid one of the "obstetrical pads" from the maternity outfit. If the patient is a large woman, and those who are to lift her are not very strong, it is better to move the cot up close to the side of the bed on which she is to lie; she may then be lifted up by two persons (usually the physician and nurse) standing side by side. As soon as she is raised from the cot, a third person draws it quickly out of the way and with one step forward her bearers place her gently in the bed and cover her with the bedclothes.

Unless the full hour after the birth of the child has elapsed she should not be moved except when the uterus is firmly contracted, and the fundus must be grasped again the moment she is laid down. During the brief interval required to change her from one bed to the other the unavoidable exertion to which she will be subjected will act as a sufficient stimulus to the uterine muscle to obviate the necessity of holding the fundus for a few seconds.

If she is to remain in the bed in which she was confined, the next step after cleansing the vulva is to unpin and remove the white sheet and rubber sheet on which she is lying, leaving the bedding underneath fresh and clean. At the instant this is done an obstetrical pad is to be slipped under her buttocks to protect the draw-sheet and avoid the necessity of changing it for as long a time as possible.

If the full hour for holding the fundus has not yet elapsed, and the nurse is not occupied with this matter herself, she is to put the room in order, as quietly, thoroughly, and expeditiously as possible. All soiled articles, basins, pitchers, and the like, are to be removed; towels, sheets, and other articles that

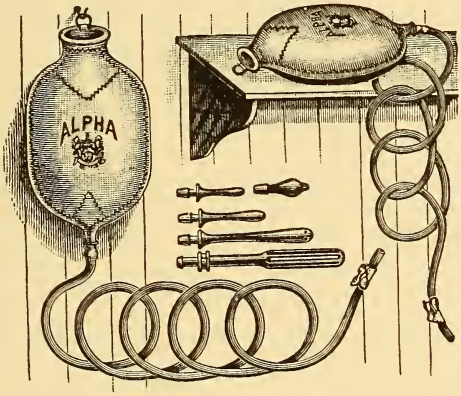


FIG. 115.—Fountain syringe.

are blood-stained are to be thrown into cold water, usually in the bath-tub with the water flowing in and out over them, until all stains are removed; the physician's instruments are to be scrubbed with nail-brush, soap, and hot water, rinsed in fresh hot water, and dried thoroughly; and the furniture arranged properly and with as little confusion as possible. The douche-bag (Fig. 115), if it belongs to the physician, is to be emptied, flushed out with hot water, and dried thoroughly, and the Kelly pad must be washed carefully with soap and hot water until it is absolutely clean, then rinsed quickly with scalding water and

dried. The air-ring must not be emptied nor the pad folded up until it is absolutely dry, or its opposed surfaces will stick together and ruin it.

By this time there will usually be no further need of holding the fundus, and the binder may be applied, so that the patient may be left to herself and allowed to go to sleep.

The *function of the binder* is often misunderstood by the laity, who are apt to suppose that it is used for the purpose of preserving the symmetry of the figure by preventing the lax abdominal walls from bulging outward. This is far from the truth, and in France, where women are supposed to be particularly solicitous as to their physical appearance, the obstetrical binder is not used at all.

The objects of the binder are two: first, to prevent any tendency to hemorrhage by keeping up a firm and constant pressure over the uterus; second, to make the woman comfortable by preventing cerebral anæmia, with its accompanying dizziness, headache, and, in some cases, even syncope.

The causation of anæmia of the brain after labor will readily be understood when it is remembered that the walls, not only of the abdomen but of the abdominal blood-vessels, are lax and flabby after the comparatively sudden emptying of the cavity and the accompanying loss of from one to two pints of blood. To fill these empty vessels blood comes rushing in from other parts of the body, and unless they are subjected to the firm pressure of the binder, so much blood will be abstracted from other organs and tissues that the result, while not necessarily serious, is bound to be more or less uncomfortable to the patient.

After about three days, when the balance of blood-pressure has again become established and the possibility of hemorrhage is past, the binder is no longer necessary, although the patient usually finds it very comfortable to wear it for a week or so more, and then, in many cases, to substitute for it an abdominal supporter (Fig. 116), which she continues to wear for another month, or until involution is complete.

Acting on these principles, the author always insists on the

use of the binder for the first three days. After this he allows the patient to decide for herself whether she wishes it used or not.

The binder should be made of unbleached muslin, one and three-quarters yards long and three-quarters yard wide. The selvage may be torn off and the winder washed and ironed to make it soft and comfortable. Not less than six should be provided, so

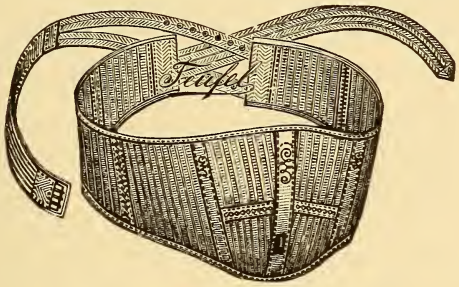


FIG. 116.—Teufel's abdominal supporter.

that soiled ones may be changed as often as necessary. Binders should not be hemmed, as the hem is apt to cause unpleasant pressure, but the edges may be "overcast" if desired. Binders of any other dimensions than those given are not desirable, and those made of two thicknesses of cloth or in any way "fitted" to the body are very impracticable. In an emergency an excellent binder can be made of a piece of "roller" towelling cut the proper length.

In applying the binder its purpose must be kept in mind and never overshadowed by efforts to gain an artistic effect in the arrangement of the pins. This is a common fault in the training that nurses receive in the wards, for not only is the strength and good-nature of the private patient often exhausted by delay and fussiness in pinning up a binder, but the binder itself is seldom as snug at every point as it should be.

The binder should be folded about half its length and slipped under the patient in the same way that a draw-sheet is changed. The ends are then held up in the air over the middle of the abdomen and the binder drawn in one direction or the other

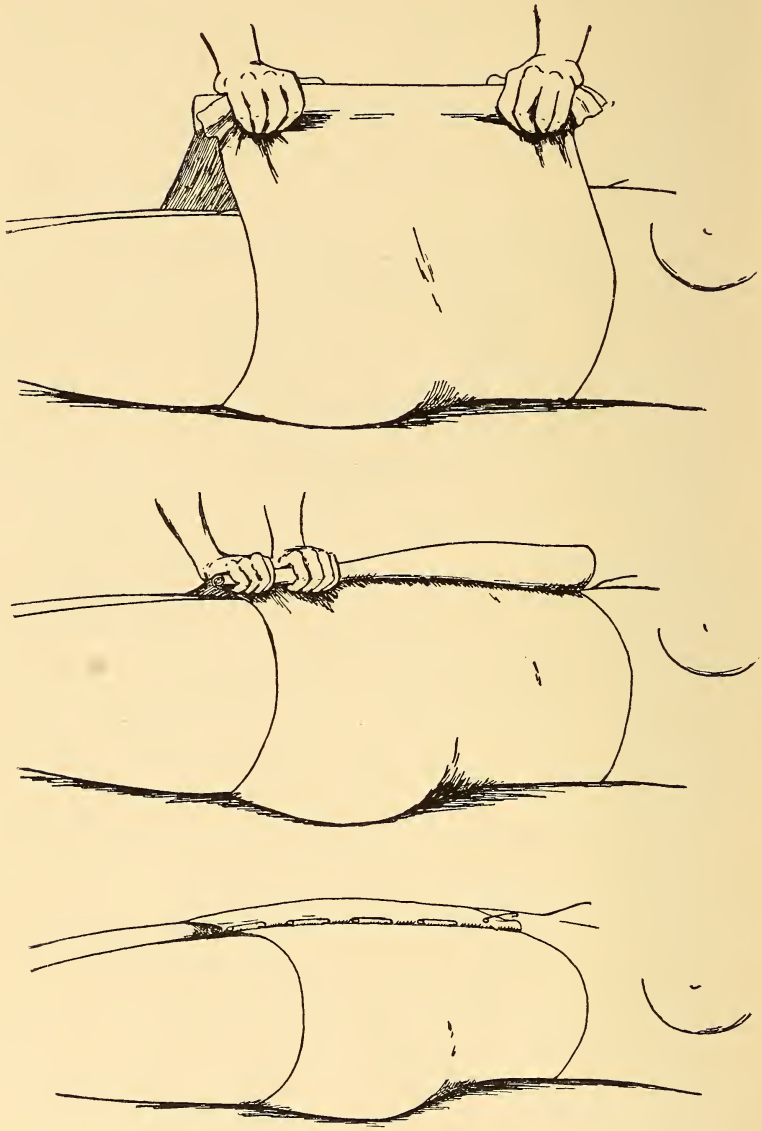


FIG. 117.—Abdominal binder.

until its middle is exactly under the middle of the patient's back, its lower edge well below the hips, and its upper edge at about the free border of the ribs. Beginning now at the lower edge, the two ends, held tightly together, are rolled up as firmly and as snugly as possible until the material at that point is as taut as it can be made. The pin is passed first through the roll and then through the single thickness of cloth on the side opposite the nurse and clasped. Beginning again a little above the first pin the rolling is repeated in the same way and another pin inserted, and so on till all is done (Fig. 117).

When at a point about the level of the umbilicus, a towel, rolled or folded to about the size of a large banana, may be laid crosswise of the abdomen under the binder, to cause extra pressure on the fundus. A pin should be passed through the binder into the towel on either side to keep it from slipping.

The binder must be changed with sufficient frequency to keep it clean and comfortable at all times, and during the first two days this should be done as often as every four or five hours. Blood trickles down over the perineum and soaks into the binder behind, soon drying and becoming stiff and irritating, so that, no matter how clean and soft the front of the binder may be, frequent changes are none the less necessary. When the soiled binder has been removed the patient should be turned on her side and the buttocks bathed gently with soap and warm water and rubbed with dilute alcohol. The amount of comfort that this affords the patient well repays the slight trouble that it entails. Soiled binders are to be washed immediately after they are removed, and boiled and ironed before they are used again.

The vulva pads must be changed at intervals of not less than every four hours, and, for the first day or two, fresh ones may be required as often as every one or two hours. If, for any reason, an apparently clean pad is taken off, it is never to be replaced, but a new one used in its stead. The reason for this absolute rule is because of the possibility of placing over the vulva that part of the pad which formerly was in direct contact with the anus. Soiled pads must be removed at once from

the room and destroyed by burning. Under no circumstances should a pad be washed or otherwise cleaned (?) and used a second time.

Every time a pad is removed the external genitals are to be bathed carefully and gently with warm green soap solution made up with boiled water. The nurse is to disinfect her hands for this purpose, bestowing on them as much care as though she were going to make a vaginal examination. Before the hands are disinfected the pad is to be unpinned and left loosely in position and a piece of paper laid on the floor to receive it. The dish containing the solution and cotton sponges is placed on a chair or on the bed within easy reach, and the parcel of clean pads is opened and laid in a convenient spot.

After the hands are clean the soiled pad is removed with a thumb-forceps and laid quickly on the paper, out of sight of the patient, to whom its appearance is usually very unpleasant. The cleansing of the parts should begin with the separation of the labia majora with the thumb and forefinger of the left hand and the careful removal of any lochial discharge that may have accumulated in the creases of the vulva. This blood is always more or less irritating and tends to become dry in spots, which adds to the discomfort that it causes. In spite of this, the patient often refrains from speaking of it, on account of her natural disinclination to require of the nurse duties which she knows must be of a somewhat repellant character. The nurse who will attend carefully to this little detail will find her efforts more highly appreciated than would seem to be warranted by the circumstance.

After this has been done the external surfaces of the labia are carefully bathed from above downward, care being taken to remove every vestige of blood from the hair. If stitches have been inserted in the perineum the nurse must take pains not to let the cotton catch and pull on the free ends of the sutures, or she will cause the patient great pain.

If any blood has collected on the buttocks and soaked into the back of the binder these parts must be made perfectly clean and the binder changed, as has already been said.

The pads and draw-sheet under the patient must be removed as often as they become soiled, but if the nurse is particular to change the pads frequently or to keep folded sterile towels over them, the draw-sheet will last for an entire day or possibly a little longer. As a rule, the draw-sheet is to be changed every twenty-four hours, and clean vulva pads must be provided at least as often as every four hours, and oftener if they are much stained, for even when they do not appear to be particularly soiled they always contain, after a few hours, enough of the lochia to serve as an excellent breeding-place for bacteria.

If the patient does not void her URINE naturally within twelve hours after labor the bladder should be emptied with the catheter, and after this she is to be catheterized every six hours until the normal function of urination is re-established.

Twelve hours is allowed in the first instance, because the relaxed condition of the bladder and abdomen after the removal of the pressure from the gravid uterus often permits considerable distention of the bladder with urine before any desire to urinate manifests itself. Every effort should be made to avoid the use of the catheter, because of the danger of infecting the parts at the time of its introduction, and also on account of the fact that its use always tends to delay the time when natural urination can be accomplished. Moreover, if the patient can once be induced to empty her bladder in the normal way, the subsequent use of the catheter is almost never required. Consequently, at the end of the first twelve hours, and thereafter at intervals of six hours, efforts should be made to excite normal urination by the familiar methods of allowing water to run from a faucet, pouring water from one pitcher to another, directing a gentle stream of warm sterile water down over the vulva, or placing under the patient a bed-pan containing hot water and letting the steam from it surround the genitals. With some patients the mere presence of a second person in the room is enough to prevent urination, and, in such cases, the nurse should always leave the room on some pretext or other as soon as she has arranged the bed-pan, taking pains to tell the patient that

she will not be back for a few minutes. Not infrequently, on her return she will find the bed-pan ready for removal.

If, however, all these efforts fail after a reasonable trial, the catheter must be used. This is an operation requiring great dexterity in the case of a woman recently delivered, for the parts are swollen and congested to such a degree that all the usual landmarks are distorted or temporarily destroyed. On several occasions the writer has been called upon to pass the catheter in the first day of the puerperium after nurses of long obstetric experience have failed utterly to find the meatus. The best catheter for the purpose in hand is the ordinary glass one (Fig. 118), about six inches long and slightly bent at the tip.

FIG. 118.—Glass catheter.

The soft rubber catheter, so often used in the belief that it is less liable to injure the delicate tissues of the parts, is not worth considering, for it possesses no advantages over the glass instrument and is inserted with much greater difficulty.

The preparations for using the catheter in private practice, where there is usually only one nurse on the case, are important, and must be carried out in detail to avoid the danger of infecting the patient.

The catheter is to be boiled and the urine should be received in the basin used for boiling the instrument, or in a douche-pan, but never in a urinal which has to be placed in position after the nurse's hands are sterilized.

The simplest, and therefore the best, method is as follows: Boil the catheter in an agate basin of sufficient size to hold all the urine to be drawn off and with only enough water to cover the instrument. Prepare Tincture of green soap solution and cotton sponges, and have a clean vulva pad within reach. Place a piece of paper on the floor to receive the soiled pad. As a lubricant for the catheter use white vaseline (in a tube) or, what is still better, any one of the preparations of Iceland moss lubri-

cants which may be had of almost any druggist. Remove the screw-top and wrap the tube in sterile or bichloride gauze. Disinfect the hands, as before, with soap and hot water and bichloride solution, and after the patient has raised her knees and separated them as far as possible, take up the basin containing the catheter with a wet bichloride towel, pour off as much water as possible without spilling out the catheter and set the basin in the bed as close up to the vulva as possible. Remove the vulva pad with thumb-forceps and cleanse the parts thoroughly. Then take up the catheter, which by this time is sufficiently cool, squeeze on it some of the vaseline or other lubricant, and lay it back in the basin out of the water. (The basin can be tilted somewhat so that part of its bottom will be

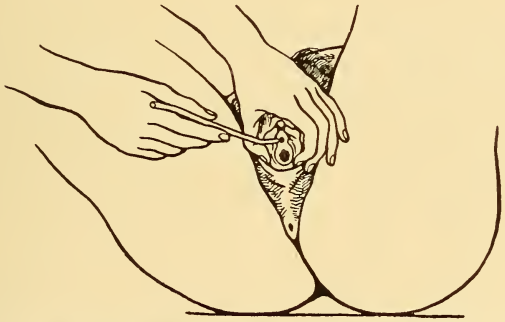


FIG. 119.—Proper method of inserting catheter. The labia separated and the meatus exposed to view.

dry.) Now separate the labia as far as possible with the thumb and fingers of the left hand, until the opening of the meatus can be seen. Wipe off the tissues surrounding the urethral orifice with a clean cotton sponge dipped in the solution and, with the left hand still keeping the labia widely apart, pick up the catheter with the other and pass it, by the sense of sight, directly through the meatus into the bladder, taking every precaution not to let it touch any of the surrounding parts (Fig. 119).

The basin, if properly placed, will be near enough to the vulva to receive the stream of urine without any difficulty.

When the bladder is empty, grasp the catheter between the thumb and second finger and press the forefinger firmly over the tip before withdrawing it (Fig. 120). When it is entirely out and over the basin the forefinger may be raised, and the urine within the tube will escape. *This is a small matter of detail, but will often save soiling the bedding or the patient's clothing.*

As has been said, every effort should be made to avoid the use of the catheter, and after the third day the patient may be allowed to sit up in bed to empty the bladder if the case is progressing favorably. This, of course, should only be done with the consent of the physician, and the nurse should make sure that no ill effects follow the exertion.

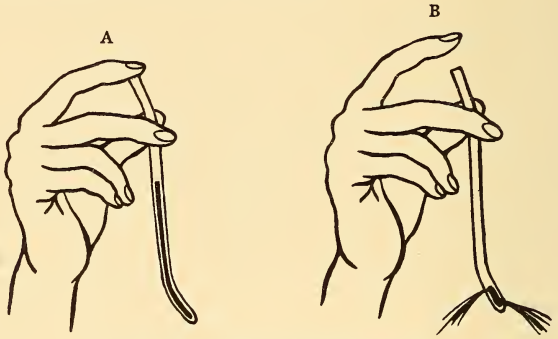


FIG. 120.—Method of withdrawing catheter.

The patient's BOWELS should have been emptied by enema at the beginning of labor, and will not, as a rule, require any attention until the end of the second day. At this time the physician usually orders a mild saline laxative, such as one-half of a bottle of the effervescent solution of the citrate of magnesia, at night, followed by the other half in the morning.

If this is not successful, a soapsuds enema may be given in the middle of the forenoon, after waiting a reasonable time for the magnesia to act. If the progress of the case up to this time has been perfectly normal, there is usually no objection to letting the patient sit up on the bed-pan to empty the bowels, and if this can be allowed the enema is seldom required.

After this the bowels are to be moved every second day by enema or otherwise, as the physician may direct, unless the natural efforts are effectual.

While the patient is on the bed-pan she is to be directed to hold the vulva-pad closely against the vulva with her hand to prevent the entrance of fecal matter into the genital canal, and the nurse, in cleansing the parts, must be careful to wipe from before backward (from the vulva toward the sacrum).

It is needless to say that no VAGINAL DOUCHE *should ever be given by the nurse except in compliance with the express directions of the physician.* If the lochial discharge emits a foul odor the physician may order a douche, but the matter must be left entirely with him.

Before giving a douche the nurse must disinfect her hands with the utmost care by scrubbing them thoroughly with soap and hot water, changing the water at frequent intervals, and then soaking them in hot bichloride solution (1 to 2000). The douche-bag and nozzle must be boiled before use, and the solution used for douching is to be made of boiled water. The douche-bag should hang about four feet above the level of the patient's bed, and the woman is to lie on a bed-pan covered with a sterile towel.

The greatest care must be taken, in inserting the nozzle, that it does not come in contact with the external surface of the body or with the hair covering the genital organs. The nurse should hold the douche-tube in her left hand, and with the fingers of the right separate the labia as far as possible so that the entrance to the vagina is clearly in sight (Fig. 121). The tube can now be introduced into the genital canal without touching any of the external tissues, and the danger of carrying infection into the vagina is effectually eliminated. The physician will, of course, instruct the nurse as to the solution to be used for the douche and its temperature, but in the absence of any definite directions, as, for example, when he merely leaves word to the nurse while she is out that the patient is to be douched, she may safely use two quarts of normal salt solution (two drachms to the quart) at a temperature of 110° F.

The TEMPERATURE and PULSE of both mother and child are to be taken every four hours during the first week and afterwards every night and morning unless the case is not doing well, when the four-hour record is to be continued. The temperatures of both patients are to be recorded on separate charts, to facilitate a clear understanding of the entire record at one glance.

The public is so well educated in the matter of clinical thermometry that these charts must be kept out of sight of the mother from the very first, so that in the event of any unex-

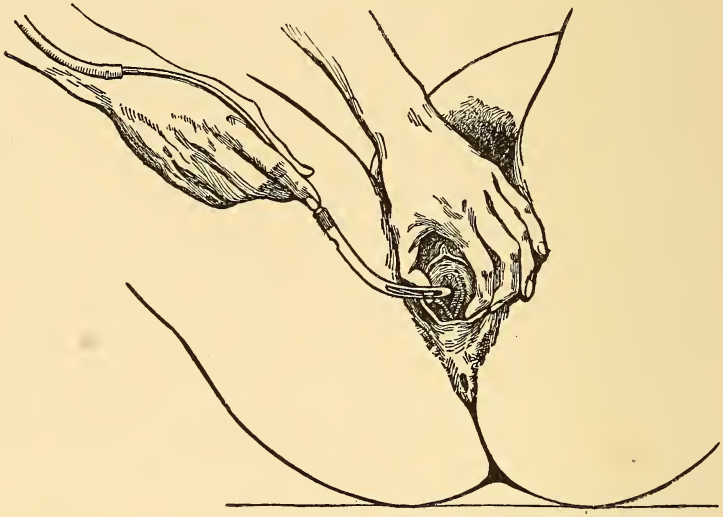


FIG. 121.—Proper method of introducing douche-tube.

pected complication she will be ignorant of the amount of her fever and unsuspicious at the withdrawal of the chart from her daily inspection.

A *pulse of 100* or a *temperature of 100.5° F.* is to be reported to the physician without delay, as either may indicate the onset of some serious disorder.

Every attention must be paid to the COMFORT of the patient, for the more nearly normal her case, the more tedious is her confinement in bed while awaiting the involution of the uterus

and other generative organs. She should be moved from one side of the bed to the other several times a day, and required to turn frequently from side to side after the first twenty-four hours. Her personal toilet must never be neglected to the slightest degree, and her face and hands should be washed and her teeth brushed several times daily. Her hair is to be well brushed and combed night and morning, and this is most easily managed by doing it up in two braids, so that there will be no mass of hair directly at the back of the head. A warm general sponge bath with a little soap is to be given once daily, and this is of especial importance on account of the excessive perspiration that occurs during the puerperium. This bath is best given at night, just before the patient is ready to go to sleep, and but one part of the body should be exposed at a time. After the bath the entire body is to be rubbed with alcohol and water (equal parts), or, on account of the peculiar odor of the lochia, which is often quite distasteful to the patient, cologne or some favorite toilet-water may be used in place of the alcohol. *It need not be said that the use of cologne or toilet-water must never be allowed to cover any laxity in the attention paid to the patient's toilet.*

The nurse must be quick to anticipate any and every need of the patient in the matter of her personal comfort, and never, under any circumstances, make it necessary for her to ask for attentions of this nature that should have been performed as a matter of course.

The DIET during the puerperium must be of a simple character, but nourishing and sufficiently varied to please the appetite of the patient. In ordinary cases the following dietary will be all that is needed.

FIRST FORTY-EIGHT HOURS: Milk (one and one-half to two pints a day), gruel, soup, one cup of tea a day, toast and butter.

SECOND FORTY-EIGHT HOURS: Milk-toast, poached eggs, porridge, soup, corn-starch, tapioca, wine-jelly, small raw or stewed oysters, one cup of tea or coffee a day.

THIRD FORTY-EIGHT HOURS: Soup, white meat of fowl, mashed potatoes, beets in addition to the above.

AFTER THE SIXTH DAY return cautiously to ordinary light

diet; that is, three meals a day, meat of an easily digested character at one of them, such as white meat of fowl, tenderloin of beef, etc. Also a glass of milk three times a day, between meals and before going to sleep at night, and a glass in the middle of the night.

Visitors should be excluded as far as possible during the first two weeks of the puerperium, and, as a rule, none but members of the immediate family should be admitted, and these for not more than five or ten minutes at a time. Friends and distant relatives are usually more interested in the baby than in the mother, and the infant prodigy may be exhibited for a brief interval to such callers in another room. The practice, common even among the better classes, of turning the lying-in chamber into a general meeting-place for conversation and gossip must be distinctly forbidden by the nurse.

Flowers, so often sent in great profusion to the puerperal woman, may be shown to her as an evidence of the interest of her friends, but should be banished at once to the parlor or dining-room. A few flowers of faint and delicate odor may be placed at the side of the bed or on a table within her sight, but large bouquets of much fragrance are too overpowering for the good of the patient.

The room is to be aired freely and with sufficient frequency each day to keep it fresh and sweet, for the lochia, the milk, the discharges of the infant, and the perspiration of the mother all tend to vitiate the atmosphere to a marked degree. In cold weather the patient is to be entirely covered with a sheet and blanket reaching above her head while the windows are opened for the purpose of ventilation.

If the arrangement of the house permits, the nurse should always sleep in an adjoining room, to which she can take the baby for the night, and in which, in fact, the infant should spend the greater part of its time. Under no circumstances should the nurse ever sleep with the patient, and if another room is not available she should be provided with a separate bed or cot.

Unless the nurse is a very light sleeper, the patient should be given a small bell with which to call her when she is needed.

The directions for the care of the infant and the management of its feeding are discussed elsewhere, and must be followed implicitly, and the nurse must keep a sharp watch for soreness or erosions of the nipples and report their occurrence at once to the physician.

THE TIME WHEN THE PATIENT CAN GET OUT OF BED, or sit up in bed, is a question that always causes her great concern, and the nurse will do best to make no positive statement in this connection even in the most favorable cases. Physicians no longer observe any arbitrary rule in keeping a puerperal woman in bed, and each case must be decided on its own merits.

As a rule, permission to sit up is granted when involution has progressed to such a point that the fundus uteri can no longer be felt above the symphysis pubis. Even this cannot always be depended upon, and many factors may have to be considered before a definite conclusion is reached.

Generally speaking, women of the class likely to come under the care of the graduate nurse are required to spend two weeks in bed, one week on a couch or on the bed, gradually accustoming themselves to the use of an arm-chair, and one week up and about but confined to the same floor. After the fourth week the patient may begin to go up and down stairs slowly once or twice daily, but six weeks in all should elapse after the birth of her child before she can regard herself as entirely freed from all restraint. The fact should be impressed upon her that this protracted period of non-exertion is not required because she is, in any sense, an invalid, but in order to permit involution to go on uninterruptedly. The idea is much the same as that which would hold in the case of a broken leg, where rest would be absolutely essential to perfect recovery, although the patient's general condition would be in no way affected.

XX

The Disorders of the Puerperium

THE DISORDERS OF THE PUERPERIUM are: *puerperal fever,* in its various forms; *phlegmasia alba dolens,* or *"milk leg;" diseases of the nipples and breasts;* and *insanity.*

PUERPERAL FEVER, also known as *puerperal septicæmia* and *"child-bed fever,"* is a condition always due to infection from without, and this infection may, and usually does, result from the introduction of bacteria into the genital tract at the time of the labor, either by the hands or instruments of the physician, or, after labor, by surgical uncleanliness on the part of the nurse, whether in the use of the catheter or in her general care of the patient. In rare instances the infection may be due to a septic inflammation of the vagina or other pelvic organs which exists at the time of the labor and extends to the interior of the uterus or to other tissues after the birth of the child.

The usual point of entrance for the septic germs is at the denuded placental site in the uterus where the tissue is "raw," and bacteria can easily find a way into the system, but any other raw surface, such as a laceration of the cervix or perineum, may afford an equally good starting-point for the disease.

There are several varieties of puerperal fever, each of which, in its typical form, presents a very characteristic set of symptoms, but it not infrequently happens that one form of the disease will eventually develop into another and more severe kind. The distinctions between these different types are, of course, of interest and importance to the physician, for not only the treatment but the prognosis depends upon the particular form of infection from which the patient suffers.

As far as the nurse is concerned, however, it is only necessary to be able to recognize at once the onset of the disease in order that the physician may be notified immediately and proper treatment instituted without delay.

Puerperal fever usually develops about the third or fourth day after delivery, but its onset may be postponed until the eighth, ninth, or even tenth day. As a rule, however, if there are no symptoms by the end of the first week none will appear at any time. The cases that develop after this period are rare, are often due to infection introduced by the catheter or otherwise several days after delivery, and are seldom of sufficient severity to endanger the patient's life, although they may seriously affect her general health for months or even years.

The patient first complains of malaise, headache, backache, and general discomfort. This is soon followed by a distinct chill, or, occasionally, only by chilly sensations, and the thermometer shows a considerable rise of temperature, often as high as 105° or 106° F. In the severe cases the pulse becomes rapid and feeble and may be irregular, and the patient's face is pale and anxious. The tongue is at first heavily coated, but later becomes brown and dry, and the lips are covered with sordes. The lochial discharge stops, or it may become dark and very offensive. The abdomen is soft and usually slightly tender over the uterus, but there is no actual pain or tympanites unless general peritonitis develops as a complication. Vomiting may or may not occur, and severe diarrhœa is very common. The urine is scanty, high colored, and may contain albumin, and if the secretion of milk has begun it ceases. The patient has alternating delirium and stupor, followed by coma, and death may occur within a few days.

These symptoms belong to the most severe type of puerperal fever, in which the infection, beginning in the uterus, extends rapidly throughout the entire system. In the milder cases, where the infection is less virulent, or where it is confined to the uterus itself or to lacerated tissue in the cervix, vagina, or perineum, the symptoms are not so pronounced, and the patient usually recovers, although she may be transformed into a confirmed invalid or, at least, remain sterile the rest of her life.

The treatment, of course, rests entirely with the physician, and usually consists in the thorough exploration of the interior of the uterus and the removal of any placental tissue, clots, or

other foreign matter that may be present and undergoing decomposition. This is, in many cases, all that is required, and the careful emptying and douching of the uterine cavity is followed by an immediate fall in temperature and improvement in every way. More often, however, it is thought necessary to perform a thorough curettage under ether in order to remove every particle of infected tissue from the uterine wall, and not a few physicians adopt this method at the outset rather than take any chances with less radical treatment.

As the prompt institution of measures to check the disease is of the greatest importance, the nurse must always be on the alert to recognize any one of the initial symptoms of puerperal fever the moment it appears and report it at once to the physician. Headache, backache, malaise, or any feeling of discomfort must not be overlooked, and a rise of temperature over 100.5° F. or of pulse over 100 should be brought to the physician's notice without delay.

These premonitory symptoms may not indicate puerperal fever, as they occur at the onset of almost any acute disease, but they are sufficiently significant to warrant immediate attention, and the nurse must never lay herself open to the charge of having neglected to recognize, and report to the physician in charge, any change in the patient's condition which might be indicative of danger.

After the genital tract has been thoroughly cleansed of all foreign matter the treatment consists solely in fighting the constitutional effects of the disease with tonics, stimulants, and nourishing diet. Crédé's ointment (unguentum Crédé), a preparation of metallic silver used by inunction, has been highly recommended as a specific by some authorities; the subcutaneous injection of hot normal salt solution often seems to give good results; and, in those cases due to infection by the streptococcus, the antistreptococcic serum (streptococcus antitoxin) has been administered hypodermically with alleged benefit; but none of these methods has the unqualified approval of all physicians, and success can only be expected to follow a judicious combination of several of the recognized means of fighting the disease.

PHLEGMASIA ALBA DOLENS ("*milk leg*") is a disease of the puerperium characterized by pain and swelling in the affected limb due to the formation of a clot in the veins of the leg itself or in those of the pelvis, interfering with the return circulation of blood. It is due to septic infection extending from the uterus to the veins of the pelvis, and thence down the leg, and usually appears about two weeks after labor, the most common time being on the eleventh or twelfth day.

The disease is ushered in with malaise, chilliness, and fever, which are soon followed by stiffness in the affected leg and pain, usually in the groin. The leg now begins to swell, either from above downward or from below upward, and in a few hours is so tense and exquisitely painful that the slightest movement causes intense suffering.

The acute symptoms last a few days or a week, after which the pain gradually subsides and the patient slowly recovers.

The course of the disease covers a period of from four to six weeks, and the affected leg seldom returns to its normal size, but remains permanently enlarged.

The prognosis is usually favorable, although in some of the very severe cases abscesses form and the disease may become very critical or even prove fatal, while in very rare instances the clot may be dislodged and carried to the heart, causing instant death.

The treatment consists in absolute rest, the use of ice-bags along the course of the affected vessels, and morphine as indicated for the pain. As the acute stage subsides, general tonics, nourishing food, and the most carefully regulated hygienic conditions are needed to build up the patient's strength.

As in all acute febrile diseases occurring after labor the secretion of milk ceases when phlegmasia alba dolens is developed, and the physicians of many years ago gave to the disease the name of "milk leg," in the absurd belief that the condition was due to a secretion and collection of milk in the affected limb. So firmly was this impossible idea fixed in the minds of womankind, that to this day the expression "milk leg" is in common use among the laity.

Diseases of the nipples and breasts. Any slight erosion of the nipple may be aggravated by nursing until an actual fissure is formed. The fissure will cause great pain at each nursing period, and the pain may be enough to absolutely prevent suckling at the affected breast. This may cause congestion of the gland, and, as the surface of the fissure offers an ideal entrance for bacteria, septic inflammation or abscess of the breast may result. Even when septic infection does not occur, the pain may seriously affect the secretion of milk and, in highly nervous or hysterical women, cause a slight rise of temperature and retard involution of the uterus and its adnexa.

If nursing is impossible the child is deprived of its proper food, while if nursing is continued in spite of the pain the proteids of the milk are apt to be increased, and the discharge from the eroded surface is extremely bad for the baby. Hence it will be seen that this condition, trivial though it may appear at first thought, exerts a most harmful influence on both mother and child.

The first symptom of erosion or fissure of the nipple is pain at the time of nursing, and careful inspection of the part will at once disclose the true nature of the trouble.

The treatment includes the preventive measures to be adopted during the last two or three months of pregnancy. These, already discussed in Chapter IX., consist in bathing the breasts night and morning with cold water, and softening the crusts of colostrum with albolene, and removing them every day, so that the delicate tissue of the nipple will not be injured by the presence of these hard deposits. If these precautions are carefully followed the nipples will be in good condition when the infant begins to nurse, and no trouble will be likely to ensue.

The treatment after the condition has developed rests with the physician, and the nurse should report to him at once if the nursing is painful or if any eroded surfaces are noticed. The usual treatment consists in cleansing the parts thoroughly and applying a solution of nitrate of silver (forty grains to one ounce) with a fine camel's-hair brush to the diseased surfaces, after which the nipple is dusted with some simple antiseptic

powder, such as aristol, and nursing stopped on the affected side for twenty-four hours.

A considerable quantity of milk will collect in the breast during the time in which nursing is stopped, and this must be removed with the breast-pump or by massage as often as the gland becomes tense and tender. The method of using the breast-pump is described in detail on page 295. Massage of the breast when merely for the purpose of removing an excessive quantity of milk is a far simpler procedure than when inflammation has actually begun, and is performed as follows: There are four distinct steps in the emptying of the breast, each of which must be practised carefully and intelligently in order to secure a good result with the least amount of pain. The breast is first cleansed gently with soap and warm water, and then anointed with warm camphorated oil or albolene. The hands of the nurse must also be disinfected with the utmost care and the fingers dipped in the oil or other lubricant to be used.

The first step (Fig. 122, A) consists in grasping the breast at its periphery with the fingers separated as widely as possible, and then drawing them towards the nipple with a firm but gentle pressure. The entire breast is to be gone over in this manner and the fingers are to be brought together as the nipple is approached, and this manœuvre is to be kept up for at least five minutes, by the end of which time the breast should be fairly soft and the milk flowing freely.

The second step (Fig. 122, B) consists in placing one hand, palm upward, under any indurated or "caked" portion of the breast, and with the fingers of the other pressing downward towards the supporting hand and forward towards the nipple. Each indurated spot is to be treated in turn in the same manner until all are soft.

The third step (Fig. 122, C) consists in pressing downward against the chest wall with the flat of the hand over any hardened areas that may remain. The pressure should be greatest on the side of the hand next to the periphery of the breast, and should gradually increase towards the nipple with a sort of rocking motion. This is followed by a rotary motion of the

palm of the hand over the induration, continued until no further softening can be accomplished.

The fourth step (Fig. 122, D) consists in grasping the entire breast in both hands and squeezing out whatever milk remains.

Massage of the breast must always be practised with the utmost gentleness, for fear of injuring the delicate structures of the gland, and, in the manner described, it should never be especially painful if it is properly performed. Any roughness in the manipulations may cause damage to the tissues and result in the formation of an abscess.

In applying the nitrate of silver solution to the fissure the nurse must separate the edges as widely as possible and touch only the denuded tissue of the fissure with the tip of the brush. Carelessness in the use of the solution not only smears the breast with a black, dirty-looking stain, but also causes more or less irritation to the surrounding parts.

When the fissure does not heal sufficiently by the end of twenty-four hours to permit of painless nursing it may be necessary to use a nipple shield for a few days, and this will always be the case when both breasts are affected at the same time, unless the child is given artificial food while the process of repair is going on. The shield (Fig. 123) must be made scrupulously clean immediately before and after each nursing, and is to be boiled once daily. It must be applied to the nipple with the utmost gentleness, and before the child is allowed to nurse enough milk to fill the glass part of the shield must be expressed into it by massaging the breast for a few moments. If this is neglected the infant will get little or no milk at all, while, on the other hand, he will suck in a quantity of air which will distend his stomach and cause colic.

The nipple shield must never be placed on the breast in such a position that when suction begins the edges of the fissure will be drawn apart, and in certain cases, such as fissure at the base of the nipple, it will do more harm than good.

The shield is always to be used with the greatest caution, and must at all times be kept in a perfectly aseptic condition. As the majority of fissures will, under proper treatment, heal

FIG. 122.—Massage of the breast.

completely in twenty-four hours, it seldom happens that the use of the shield is necessary, and when, for any reason, it must be employed, it should be laid aside the moment that it can be dispensed with.

If the nipples are in a healthy condition the mother should never be allowed to use the shield merely to avoid the discomfort caused by the suckling of a vigorous child.

Mastitis (inflammation of the breast) may be of any grade, from a simple congestion to a suppurative process that results in the formation of multiple abscesses in the glandular tissue.

FIG. 123.—Nipple shield. Best kind.

The cases of simple congestion may be due merely to over-secretion of milk and consequent distention and congestion of the mammary gland, but those accompanied by suppuration are always due to septic infection which enters usually through a denuded or diseased nipple.

There are *four* periods when mastitis is especially liable to occur, but it may make its appearance at any time during lactation. The periods of greatest frequency are during the first month, and especially the first fortnight after birth, when the nipples are tender and not accustomed to nursing; whenever nursing is suddenly stopped (as, for example, on account of the death of the child) and the breast becomes engorged with milk; at the time when the infant cuts its teeth and the nipples

are again exposed to injury; and at the end of lactation, either because of hypersecretion of milk due to careless management when the infant is weaned, or because the child, being dissatisfied with the quality or quantity of the milk, shows its displeasure by biting or gnawing the nipple until it is injured and sore.

The first symptoms of mastitis are a feeling of discomfort and pain in the breast, followed by chilliness or a distinct chill and a sharp rise of temperature to 105° or 106° F. Inspection shows that the gland is tense, hard, nodular, red, and exquisitely painful.

If treatment is begun at once, it may be, and often is, possible to check the disease at the outset, but to accomplish this result energetic measures must be resorted to without delay.

The physician must be notified immediately, and if there promises to be a wait of several hours before his presence or his advice can be secured the nurse may properly proceed to empty the breast, empty the bowels, and apply an ice-bag.

The breast is to be emptied by massage combined, if necessary, with the use of the breast-pump, and all the milk that can be extracted is to be removed.

A snug breast-binder (Fig. 124) is now applied and, after it is pinned, holes about the size of a half-dollar are cut over each nipple to allow the milk to escape. This can be done by picking up the material directly over the nipple with a thumb-forceps, drawing it well away from the body, and cutting through it with scissors, after which the opening is carefully enlarged to its proper size and shape. If a piece of cotton is laid over each nipple before the binder is applied, there will be no difficulty whatever about grasping the muslin, and after the hole is cut the cotton may be left until it is soaked with milk, when it is to be removed and fresh pieces inserted. An ice-bag is now placed over the inflamed area and left until all inflammation has subsided or until the physician orders its removal. The bowels are best moved with a saline cathartic, such as sulphate of magnesia (Epsom salt), one-half ounce in half a glass of water.

Nursing must, of course, be stopped at the affected breast,

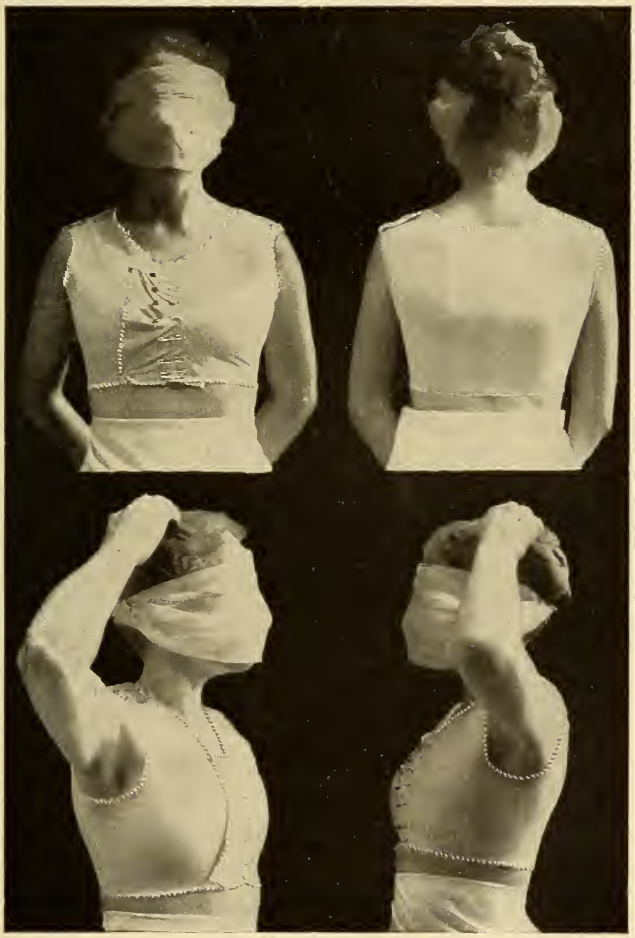


FIG. 124.—Author's breast-binder.

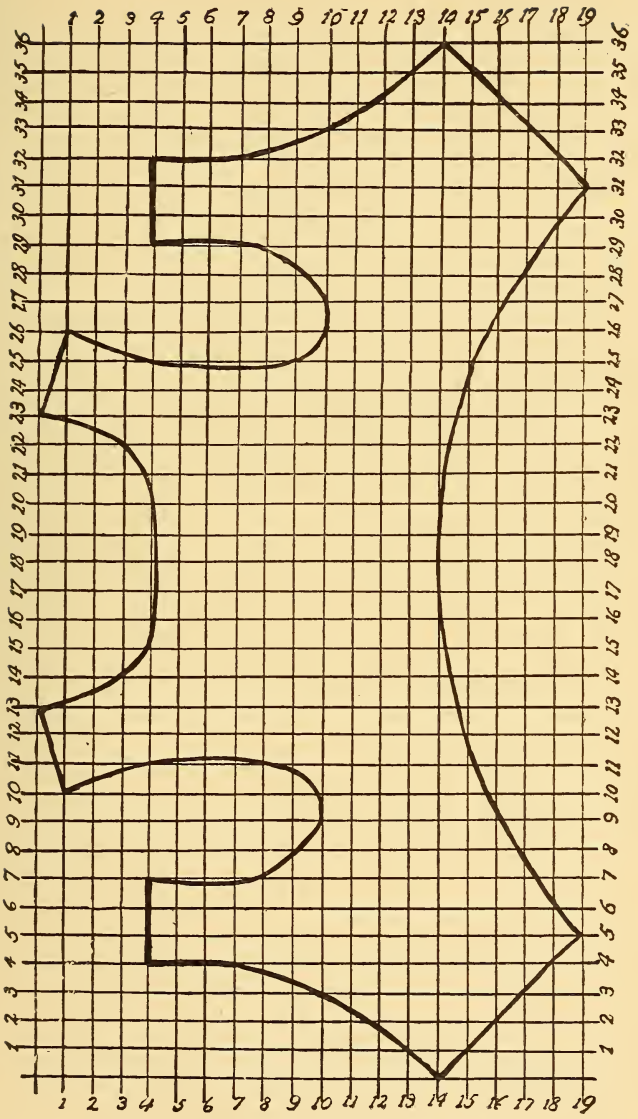


FIG. 125.—Pattern of author's breast-binder.

and the ingestion of fluids is to be restricted as much as possible until all the symptoms have disappeared.

This treatment, if begun at once, is usually successful in checking the disease, but, as has been said, it must be instituted without a moment's delay if it is to be effective.

If it is unsuccessful and the case goes on to suppuration, the treatment is necessarily surgical, and the nurse can only follow the directions of the medical attendant.

It may be said that the cases of mastitis that develop during the first month after labor seldom go on to suppuration, but those appearing later in the puerperium are very likely to do so unless they can be checked in the manner described.

Syphilitic lesions may be found on the nipple, either primary from the bite of a syphilitic child, or of the tertiary type in a woman who is suffering from the disease in its advanced stage. The matter would, of course, be brought at once to the attention of the physician, and the treatment is the same as it would be under any other conditions.

Eczema of the nipple and areola, and occasionally extending over the entire breast, is a rare complication that may arise during the puerperium. Its treatment is both local and general, and can only be carried out by the physician.

Insanity may occur at any time after conception and disappear within a few days or even hours, or it may continue throughout the entire pregnancy, into the puerperium, and even through the whole period of lactation.

The *insanity of pregnancy* is usually *melancholia,* and is often so slight that it is entirely unnoticed, but it may, on the other hand, be very pronounced, with a marked suicidal tendency.

The *insanity of the puerperium,* called *"puerperal insanity,"* is most often of the *maniacal type,* and is the most common of the three varieties. The mania usually appears within a month after delivery, either following the melancholia of pregnancy or without any warning whatever. The patient is at first restless and disagreeable, and soon evinces a marked dislike for her husband and others who are most nearly related to her,

or else the mania develops suddenly with no premonitory symptoms. The woman becomes noisy, talkative, and incoherent, and her mind may dwell on religious subjects, or she may be profane, obscene, and vulgar, with an absolute loss of all sense of decency or modesty. The tendency to suicide or murder is always strongly marked, and the patient must be most carefully watched.

The *insanity of lactation* is usually of the *melancholic* type, like that of pregnancy, and is most commonly seen in multiparæ who have borne many children in rapid succession and whose general condition is greatly impaired.

The causes of insanity cannot be stated very definitely, but may be supposed to include all conditions that greatly undermine the general health of the patient. This would comprise severe injuries, mental disturbances, albuminuria, eclampsia, chorea, hemorrhages, septic infection, pronounced anæmia, and painful or prolonged labors. Heredity seems to play an important part in the causation of this condition, and illegitimacy often exerts a sufficient effect on the mother to account for the insanity of pregnancy or of the puerperium among unmarried women.

These cases are seldom fatal except through personal injury inflicted by the patient herself, but quite a number die eventually of exhaustion, and others become chronically and hopelessly insane. Unless the patient recovers entirely within a year it is almost certain that she will remain permanently demented, but the majority of cases do not last more than a few weeks or a month.

There is a sudden transitory mania which sometimes occurs *during labor*, but it is probably an hysterical manifestation due to the severity of the pain, and it disappears within a few minutes.

The treatment of these cases lies entirely with the physician, and consists chiefly in building up the shattered constitution with nourishing and easily digested food, fresh air, good hygienic surroundings, and careful nursing and attendance.

The maniacal cases should be placed in an asylum, unless

the circumstances warrant the employment of a sufficient number of nurses for both day and night duty to keep the patient under constant surveillance, and even in the melancholic cases the suicidal and homicidal tendencies must be kept in mind at all times.

XXI

Abortion and Miscarriage

ABORTION, MISCARRIAGE, and PREMATURE labor are all terms which indicate the premature discharge of the fœtus from the cavity of the uterus. When the embryo is expelled before the end of the third month of gestation, the word "*abortion*" is, technically, the correct term to employ; while from the end of the third month up to the earliest date at which the child can, by any possibility, live (about six and a half months) the term "*miscarriage*" is used. If the woman is delivered at any time after the middle of the sixth month and within about two weeks of the proper end of her pregnancy, the birth is described as "*premature labor.*" While, as has been said, the expulsion of the uterine contents during the first three months of gestation is technically termed "abortion," this work is so intimately associated in the public mind with some form of criminal procedure that the nurse should never use the word under any circumstances, but group all such accidents occurring before the period of viability of the child under the general term "miscarriage."

The first symptom of either abortion or miscarriage is usually pain of an intermittent character, followed soon by bleeding due to the separation of the placenta from its uterine attachment. In some cases the bleeding appears first, and the pain, which is of a "bearing down" type resembling that of labor, comes later.

Premature emptying of the uterus at any time may be caused by fright, grief, or other form of severe nervous shock; it may result from disease of the mother or of the fœtus, or from external injury, such as a fall, or a blow or kick over the abdomen. In the latter class of cases the element of fright must also be considered. Whenever the mother is suffering from an acute febrile disease she will surely miscarry if the temperature reaches 105° F., and she may do so at a much lower

degree. Hence in such cases the nurse must be always on the lookout and fully prepared for this accident.

When abortion or miscarriage threatens the patient she is to be put in bed on her back and kept perfectly still until the physician arrives. If the symptoms are severe, one-sixth grain of morphine may be given hypodermically to relieve the pain and allay the nervousness of the patient. In many cases this treatment will be all that is necessary, and the pain will cease, the bleeding stop, and the case go on to full term without further interruption. In other cases the symptoms will increase, and eventually the fœtus and its envelopes will be expelled from the uterus, either wholly or in part. The bleeding in these cases is seldom if ever enough to cause any serious alarm before the physician arrives, but it is of the utmost importance for the nurse to save for his inspection every particle of blood or other matter that comes away from the uterus. In many cases the embryo is so small that it is easily lost in a blood-clot, and unless the physician is afforded an opportunity of examining the discharges himself he cannot know exactly how much, if any, of the ovum has been expelled. Lacking this positive knowledge of the actual condition of affairs, the surgeon is obliged, in the interest of his patient, to proceed as if part, at least, of the ovum remained in the uterus, and a little care and forethought on the part of the nurse might have been the means of saving the patient the discomfort, not to say the danger, of a curettage under ether.

Abortion and miscarriage are by no means the trivial matters that they are so commonly supposed to be by women in general. The process is distinctly an abnormal and unnatural one, and as the uterus is not prepared to cast off the placenta as it would at the normal end of pregnancy, some part of it is almost certain to be retained in the cavity of the womb. These retained fragments of placental tissue cause chronic inflammation of the membrane lining the uterus, even if they do not decompose and result in "blood poisoning," with the possible death of the patient. In any event the outcome is bound to be serious unless the case is most carefully and intelligently treated, and even in

those cases in which the entire ovisac has apparently come away a thorough curettage under general anæsthesia is usually indicated as the safest procedure to follow. The nurse should use all her influence to impress upon patients the serious nature of abortion and miscarriage when proper treatment is neglected or refused, and it is safe to say that the dangers to the woman are considerably greater than are those which follow in the train of a normal labor at term.

FIG. 126.—Lithotomy position. Limbs supported in Robb's leg-holder and covered with canton flannel leggings.

If CURETTAGE is to be performed after abortion or miscarriage, the preparations for the operation are the same as when it is indicated in any other condition. If there is sufficient time a soapsuds enema with one drachm of turpentine should be given to thoroughly empty the lower bowel. No solid food should be

allowed within six hours of the operation, on account of the ether.

The woman is to be etherized and prepared for operation in precisely the same manner as for forceps delivery except that, if possible, she should lie on a firm table instead of on the bed. She is to be placed in the lithotomy position (Fig. 126), and the legs are to be supported in some form of leg-holder (Figs. 127 and 128), or with the metal leg supporters screwed to the

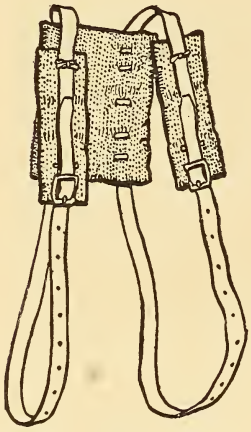


FIG. 127.—Author's leg-holder.

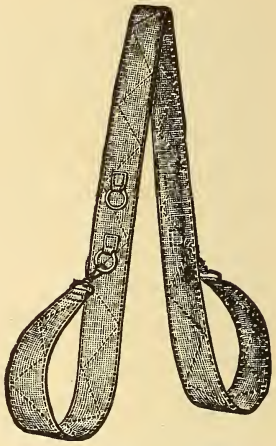


FIG. 128.—Robb's leg-holder.

sides of the table if the physician has them. A strong, narrow kitchen table is the best for use in private practice, and it is to be covered with a folded blanket, rubber sheeting, and a clean white sheet, all pinned securely under the corners. As the patient will be removed to her bed as soon as the operation is concluded, she may be anæsthetized in bed, and need not know that a table is to be used. Many women, who will submit to almost any surgical procedure so long as they are not removed from their beds, are stricken with terror at the mere suggestion of performing the same operation on a table, and it is best to keep all preparations out of their sight as far as possible.

The *instruments* used for curettage are—

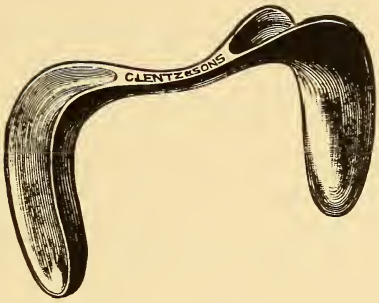


FIG. 129.—Sims's speculum.

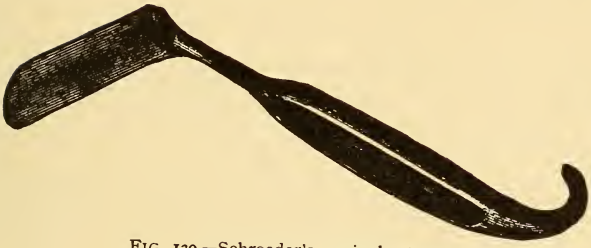


FIG. 130.—Schroeder's vaginal retractor.

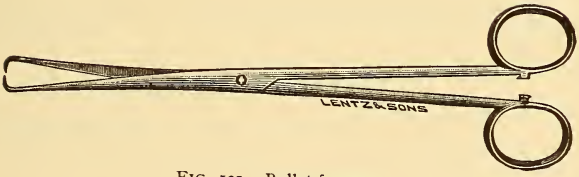


FIG. 131.—Bullet-forceps.

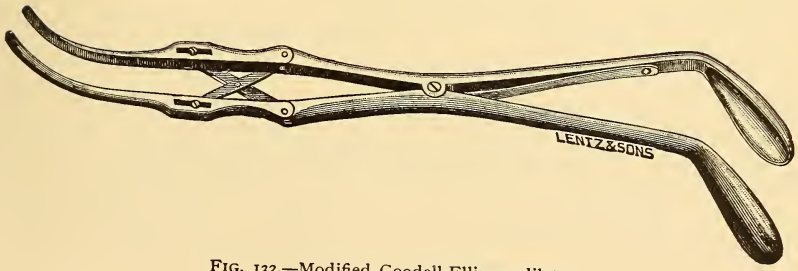


FIG. 132.—Modified Goodell-Ellinger dilator.

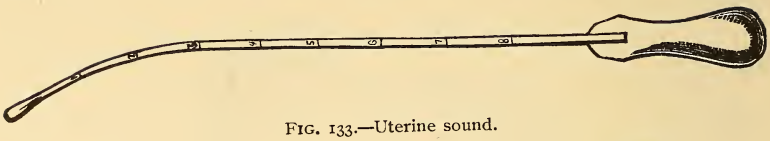


FIG. 133.—Uterine sound.

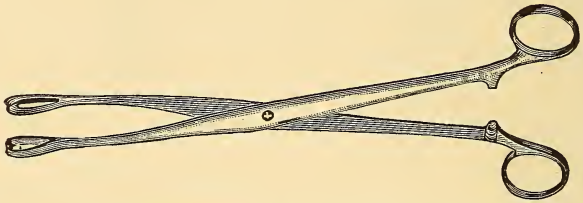
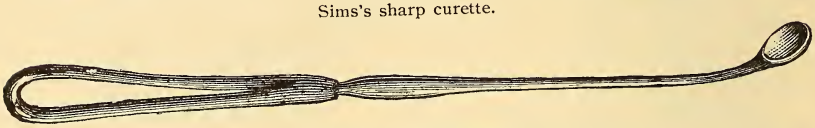
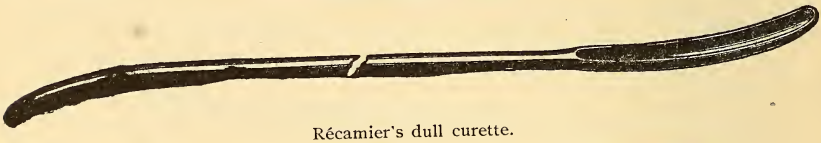


FIG. 134.—Placenta-forceps with heart-shaped jaws.

Sims's sharp curette.



Simon's sharp curette.



Récamier's dull curette.

Thomas's large dull wire curette.

FIG. 135.—Curettes.

FIG. 136.—Sponge-holder.

Sims's speculum (Fig. 129), or a vaginal retractor (Fig. 130).

Bullet forceps (Fig. 131).

Goodell uterine dilator (Fig. 132) occasionally.

Uterine sound (Fig. 133).

Placenta forceps (Fig. 134).

Curette (Fig. 135) according to the case or to the individual preference of the operator.

Sponge-holders (Fig. 136), at least four.

Uterine applicators, four or five, wrapped with cotton.

Double current catheter (Fig. 137).

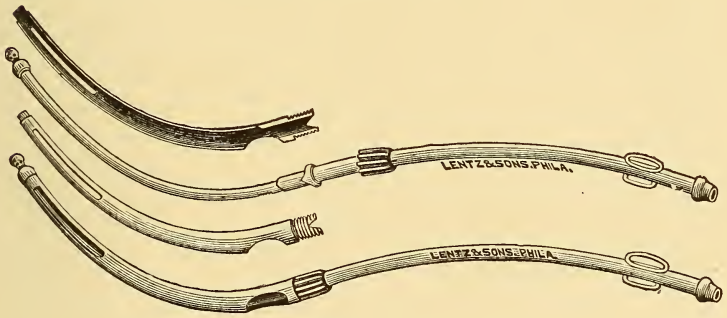


FIG. 137.—Two-way catheter. (Kelly.)

A Kelly pad is to be placed under the patient's buttocks, to drain into a pail at the foot of the table, and there should be a small table at the head for the hypodermic syringe and other articles used by the anæsthetist. A chair should face the buttocks for the operator, and at his right-hand side should be a low table within easy reach for his instruments. In private practice a dress-maker's "cutting-table," to be found in nearly every house, is best for this purpose. The carpet at the foot of the operating-table is to be protected with many layers of old newspapers, over which a sheet should be securely tacked.

A suitable place must be provided for hanging a douche-bag, and if the operation is done at night this can usually be attached to the chandelier, which will be directly above the patient's buttocks.

If daylight is to be used, the windows must be protected so that outsiders cannot see into the room, and yet the supply of light must be curtailed as little as possible. If there are lace curtains in the window they may be pinned securely together, or the windows may be covered with newspapers, white wrapping paper, or cheese-cloth. Another method is to cover the glass with whiting mixed with water to the consistency of a thick paste, as it would be used for cleaning silver. There is no danger that this covering will fall off, and it scarcely interferes at all with the passage of light. The operating-table is to be placed in such a position that the light will fall over the left shoulder of the surgeon. In the daytime the back of the operator's chair should be towards the window, and at night the patient's buttocks should lie directly under the middle of the chandelier.

The nurse should have ready one dozen clean towels wrapped in parcels, sterilized or baked in the oven, plenty of boiled water, both hot and cold, and a long stout sheet, to be used as a leg-holder in case the physician does not bring one with him.

The patient should be attired in night-gown and stockings only. The external genitals must be carefully cleansed, and if the pudendal hair is at all long or thick, it should be clipped closely with scissors, unless the physician wishes the parts shaved.

After the patient has been etherized, placed in proper position on the table, and covered with sterile or bichloride towels, the operator will seat himself in the chair directly facing the vulva, insert the Sims speculum or the vaginal retractor to depress the perineum, and grasp the anterior lip of the cervix with the bullet-forceps to draw it forward. The nurse should have everything so arranged that it will not be necessary for her to leave the patient's side, and is now to assist the operator by standing or sitting at his left hand and holding the retractor and bullet-forceps in the manner shown in Fig. 138 while the operation is in progress. The patient's bed is to be made up with rubber sheet, white sheet, and draw-sheet, and the pillow should be removed and a large towel laid in its place for use as she comes out of ether.

Hot-water bottles (improvised most readily from beer-bottles with patent stoppers) should be at hand at the end of the operation, and if the case is at all a serious one the patient should be laid between blankets instead of sheets until she comes out of ether and reacts from the shock.

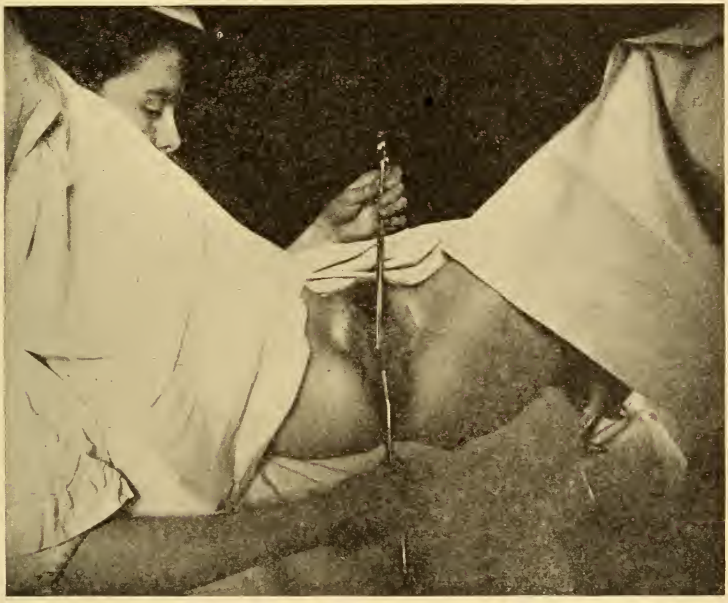


FIG. 138.—Patient ready for curettage. Proper position of nurse, holding vaginal retractor in right hand, and bullet-forceps, drawing down anterior lip of cervix, in left.

The *after-treatment* of abortion and miscarriage, whether or not curettage has been performed, consists in the practice of the most scrupulous cleanliness and in the frequent removal of all discharges from the folds and creases of the external genital organs. Douches should never be given except by the express order of the physician, and the patient is to remain in bed on a light but nourishing diet for at least ten days.

PREMATURE LABOR does not differ in its management to any marked degree from normal labor. There is, however, more of a tendency towards retained membranes or placenta, and the

shock to the mother in her disappointment over the possible, if not actual, loss of her child often has a serious and very depressing effect on her nervous system and so upon her convalescence. The care of the premature child is discussed in another chapter.

XXII

The Care of the Normal Infant

As soon as the mother has been made clean and comfortable after the delivery the attention of the nurse may again be directed to the child for a brief period.

The infant was wrapped in a warm flannel blanket and laid in a safe place at the time of its birth, and has been examined occasionally by the nurse to see that its breathing is satisfactory and that there is no bleeding from the cord. If the room is cold or the child is not warm and rosy, it should be surrounded with hot-water bottles, wrapped in towels to prevent the possibility of burning its delicate skin. The physician will, when the opportunity offers, inspect the infant's body carefully for deformity, injury, or abnormality of any sort, and if it is perfectly developed, inform the mother of its satisfactory condition. If deformity or injury is found, it is best to keep the knowledge from the mother for as long a period as possible by giving more or less non-committal replies to her interrogations, but as soon as she begins to suspect in the slightest degree that she is being deceived as to the child's condition it is wiser and kinder to make a clean breast of the whole affair and tell her the facts frankly, but in as gentle and sympathetic a manner as possible, and with every encouragement that can reasonably be offered.

As soon as the room has been made presentable the nurse will find time to anoint the baby carefully with warm sweet oil or albolene, to remove the vernix caseosa which covers the body and is described on page 53.

The oil is poured into a glass or cup, which is placed in a vessel of hot water and allowed to stand until it is thoroughly warm.

The nurse sits in a low, comfortable chair without arms, in a part of the room protected from drafts, lays a soft bath towel or

a small flannel blanket on her lap, and places the infant so that its feet are towards the source of heat, whether a fireplace, stove, register, or radiator, and its eyes away from the light.

A clean flannel blanket is placed where it will warm thoroughly and be ready to wrap the infant in as soon as it is anointed.

The baby is now turned on its face, with its head extending slightly beyond the edge of the nurse's lap so that it can breathe freely, and the oil or albolene is applied gently but rapidly with a good-sized pledget of cotton to its back, and especially in the creases of the knees, buttocks, and neck, and back of the ears, where the vernix is most abundant. As soon as this is done a flannel binder is placed across its back, with the middle of the binder in the median line of the body, and the child is covered with a fold of the towel on which it is lying. The head is now thoroughly anointed with the oil and fresh cotton, to soften and remove the crusts of blood and particles of vernix caseosa that may be in the hair, but great care must be taken that nothing trickles down the forehead into the eyes.

The child is next turned carefully on its back, with the flannel binder lying under it, and the front of the body anointed in the same way, particular attention being paid to the armpits and the creases in the elbows, groin, and under the chin.

The physician may now dress the cord, or, if this has been left to the nurse, she will proceed to do it according to his directions. In the absence of any definite instructions by the physician a simple and very satisfactory method of dressing the cord is with absorbent cotton saturated with alcohol (ninety-five per cent). Enough alcohol is poured on the cotton to wet it thoroughly, and it is then squeezed out until it is nearly dry. It is next shaped into a flat circular pad about three and one-half inches in diameter and a hole made in the centre with the finger. The cord is drawn gently through the hole and the cotton folded over it at the sides (Fig. 139). The stump of the cord will always have a tendency to lie in a certain position on the abdominal wall, and this should be respected and no attempt made to bring it into the median line if it falls naturally to one

side. In other words, the cord is to be disturbed as little as possible, and merely covered with the cotton wherever it chances to lie.

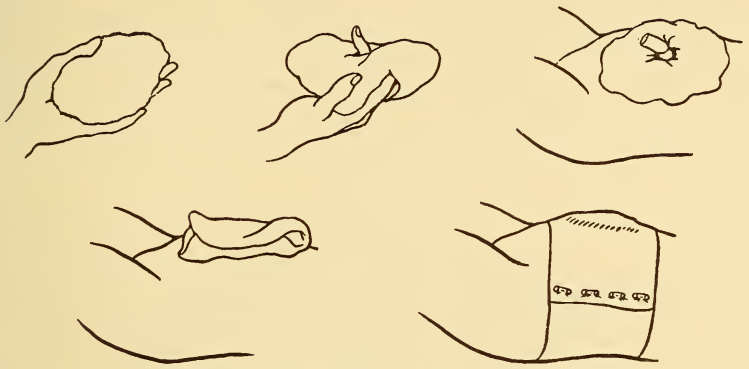


FIG. 139.—Method of dressing the umbilical cord.

This dressing is held in place by the flannel binder, which, as will be remembered, is already lying under the infant and needs only to be brought over the abdomen on either side and pinned fairly snugly with small safety-pins a little to the right or left of the median line, as shown in the figure.

Unless the dressing becomes soiled with urine or otherwise, it need not be disturbed at all but allowed to come off with the cord some time between the fifth and eighth day. If it is necessary to remove it, only such of the cotton as can easily be freed from the cord need be taken away and the fresh dressing applied exactly as in the first instance. The little tags and fibres of cotton that adhere to the cord will be sufficiently sterilized by the application of the fresh alcohol.

A soft diaper may now be put on, and if the infant's feet are cold little knitted socks or bootees should be used.

The baby may now be wrapped carefully in a clean, warm blanket and laid in a warm place, with its head covered and its eyes protected from the light, where it will usually grunt contentedly or go to sleep until the nurse has finished her other duties and made her preparations for its bath.

The bath need not be given for several hours, or until every-

thing has been put to rights, the placenta destroyed, the soiled linen removed to the laundry, and the entire household restored to a state of equanimity.

The preparations for the infant's bath are important, and must be made with care. The articles needed are: an infant's bath-tub, which may be a small foot-tub resting on a chair or low table, or, preferably, a rubber tub supported on a wooden frame of sufficient height to prevent unnecessary stooping (Fig.

FIG. 140.—Folding rubber bath-tub. (Davis.)

140); a double wash-basin (Fig. 141), with one compartment for the face sponge and water and the other for the body sponge and water; white castile soap of good quality; two sponges of different sizes, the larger for the body and the smaller for the neck and ears; a soft wash-cloth for the face and head; baby powder of good quality in two boxes with puffs, one for the buttocks and groin and the other for the neck and armpits; two pitchers of water, one hot and one cold; a table with baby basket

and scales; a rack for the infant's clothing placed near the source of heat to warm the garments; a cup of warm boric acid

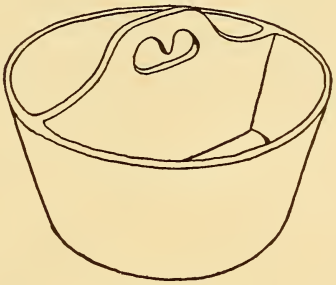


FIG. 141.—Double wash-basin.

solution on the table, with soft gauze wipes for the eyes and mouth; a low, comfortable chair, without arms, for the nurse; a rubber apron for the nurse and a good supply of soft towels; two good-sized paper bags, pinned together (Fig. 142), for

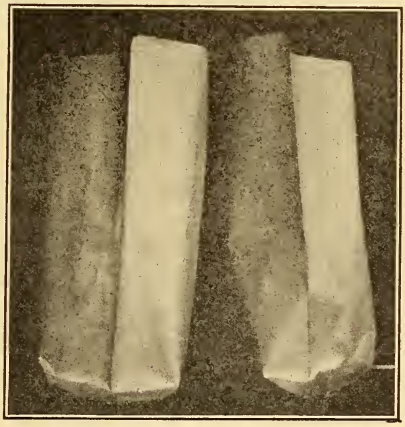


FIG. 142.—Paper bags pinned together. One for soiled clothing to be washed; the other for articles to be destroyed.

soiled articles; and a bath thermometer. The infant's clothing, diapers, binders, and the like should be on the rack within easy

reach, and the baby basket is to be properly filled with everything that may be needed in the way of pins, cotton, gauze, pieces of old linen, etc.

The excellent diagram of the ideal nursery (Fig. 143), taken from Rotch's "Pediatrics," shows clearly the proper arrangement of the various articles, and demonstrates perfectly the line of air-currents (or draft) when the room is heated by an open fireplace and ventilated, as it should be, by placing a well-fitted board about four inches wide under the lower sash of the window. A moment's study of this drawing will enable the nurse to understand clearly the course of air-currents, and, in any room, select a corner that will be free from draft.

The bath is to be given daily at the same hour, in the late forenoon and just before a feeding time, so that the infant can be put to the breast as soon as its toilet is completed.

The temperature of the bath may vary somewhat according to the age and strength of the infant, but it must never be cold enough to cause shivering or blueness of the extremities, and must invariably be gauged by the thermometer and not "guessed at" by the nurse. In a general way the following table, given by Rotch, will meet the requirements of most infants, but the effect on the child must be watched carefully and the temperature raised if necessary.

TEMPERATURE OF THE BATH FOR DIFFERENT AGES.

Age.	Temperature.
At birth	98° F.
During first three or four weeks	95° F.
One to six months	93° F.
From six to twelve months	90° F.
Twelve to twenty-four months	86° F.
Then gradually reduce in summer to	80° F.
In third or fourth year, if possible, reduce to	75° F.

The child is laid on its back on the nurse's lap, which is protected with a rubber apron covered with a soft bath towel or woollen blanket, and undressed with the exception of its diaper and binder. The body is covered with folds of the bath towel on which the infant is lying, and the eyes and mouth are gently

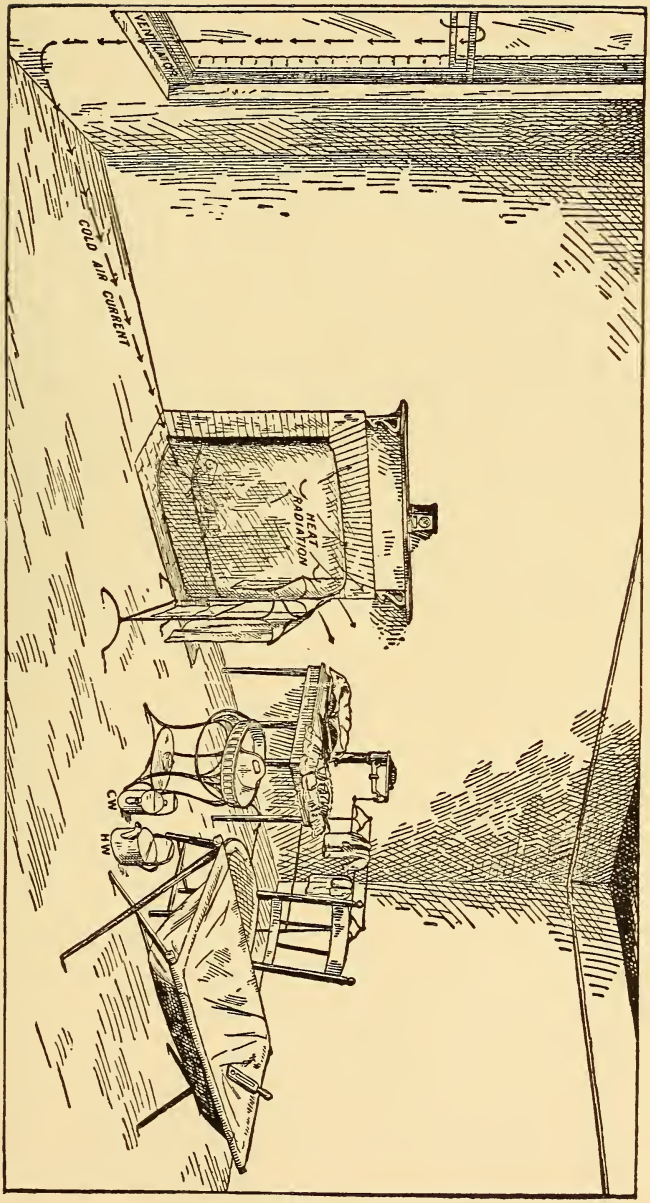


FIG. 143.—Diagram of nursery. (Rotch.) Showing direction of air-currents and proper arrangement of furniture.

bathed with the boric acid solution and small pieces of gauze or old soft linen. The baby's head and face are now washed gently and quickly with a soft cloth and soap and dried rapidly with a soft towel, care being taken that no soapy water gets in the eyes. As soon as this is done the head is protected from cold with a dry towel, and the binder and diaper are removed. The two paper bags, pinned together (Fig. 142), are on the floor by the nurse's side, and into one is thrown the diaper and other articles destined for the laundry, while the other receives the square of gauze from the centre of the diaper, of which more will be said later, the wipes used for the eyes and mouth, the cord dressing if it is removed, any pledgets of cotton that may have been used, and all other articles that are to be burned. At the end of the bath the bags are separated, folded up, and one sent to the laundry while the other goes to the furnace. If the bowels have moved, the fecal matter is to be wiped away carefully with pledgets of cotton, which are deposited in the proper bag.

The child's body is now to be soaped thoroughly and quickly with the sponge and water from the proper side of the double basin, and as soon as this is done the infant is lifted carefully into the tub and allowed to kick and splash for a few seconds. If the cord has not yet separated, the child's back is to be supported with one hand so that the navel will not sink below the surface of the water, but as soon as the umbilicus has healed the entire body may be immersed up to the neck.

Nearly every baby will thoroughly enjoy its daily bath if it is begun immediately after birth and before the child is old enough to know the meaning of fear, but when the tub-bath is not commenced until the infant is several weeks old, or if it is ever dropped or otherwise frightened or injured in the bath, it may require great patience and perseverance to overcome the little one's terror of the water.

The nurse must make sure that the water is of the proper temperature, and the baby is to be held firmly and dipped in the water slowly and carefully to avoid any sudden shock. When the child is, for any reason, actually afraid of the water, a thin

towel may be laid across the top of the tub, covering it entirely, and the baby held over the towel and then lowered very slowly and carefully into the water (Fig. 144). A few baths given in

FIG. 144.—Lowering infant into bath. Tub covered with a towel to hide the water from a nervous child.

this way may be successful in reassuring the infant and overcoming its fear.

After a few seconds in the tub the child is returned to the nurse's lap, covered at once with a warm towel, and "spatted" softly until it is dry. A small soft towel is then used for drying the creases of the body and the armpits, groin, and buttocks, and talcum powder is applied lightly to all folds of the skin and places where moisture might collect.

REMEMBER that the baby is to be soaped and washed on the nurse's lap, and not in the tub until it is old enough to sit up; that separate sponges, wash-cloths, and waters are to be used for the body, buttocks, and face; and that different powder-boxes and puffs are needed for the neck and buttocks.

The infant, wrapped in the towel, is now laid in the scales and the weight carefully noted and recorded on the weight chart

after the bath. Before recording the weight the towel is to be weighed and its weight deducted from that of the infant and towel together.

If the cord dressing has been removed it is replaced in the manner already described and the binder pinned carefully over it. The diaper, folded in triangular shape, is laid well up under the buttocks and on it is placed a square of folded gauze, lintine, or old soft pieces of napkins or table-cloths, which will absorb a good part of the urine and take up all the discharges from the bowels. These are to be changed and destroyed as soon as they become soiled, and their use will effect a great saving in washing. The diaper is now pinned carefully and fastened to the binder in front, and the infant's socks or bootees are put on and tied loosely.

The outer clothing consists of three pieces,—an undershirt of stockinet with sleeves, a flannel petticoat without sleeves, and a muslin slip (Fig. 145). These garments are all made so that they can be fitted into each other before the infant is bathed and all slipped on at once. They should be drawn up over the feet and never put on over the head, for fear of frightening the baby, and after the sleeves are adjusted properly the child is turned on its face and the three layers of clothing buttoned in the back.

It will be seen that this method of dressing the child causes no pressure on the chest or elsewhere, and allows perfect freedom of movement to all its muscles. As the infant is turned over but once in the entire process of dressing, it is not tired or excited as when the old-fashioned style of clothing is used. On this account it is not at all fretful, but more or less drowsy, after its bath, and quite inclined to nurse and go to sleep at once, to the great comfort of every one concerned.

A folded diaper may be laid loosely under its buttocks, between its body and the undershirt, to protect its clothing, and its diapers must be changed the instant they are wet or soiled.

In the case of a male infant the nurse should begin, when it is about a week old, to retract the *prepuce,* or " foreskin," covering the *glans penis,* drawing it back a little every day until all the adhesions are broken up and the entire glans is exposed.

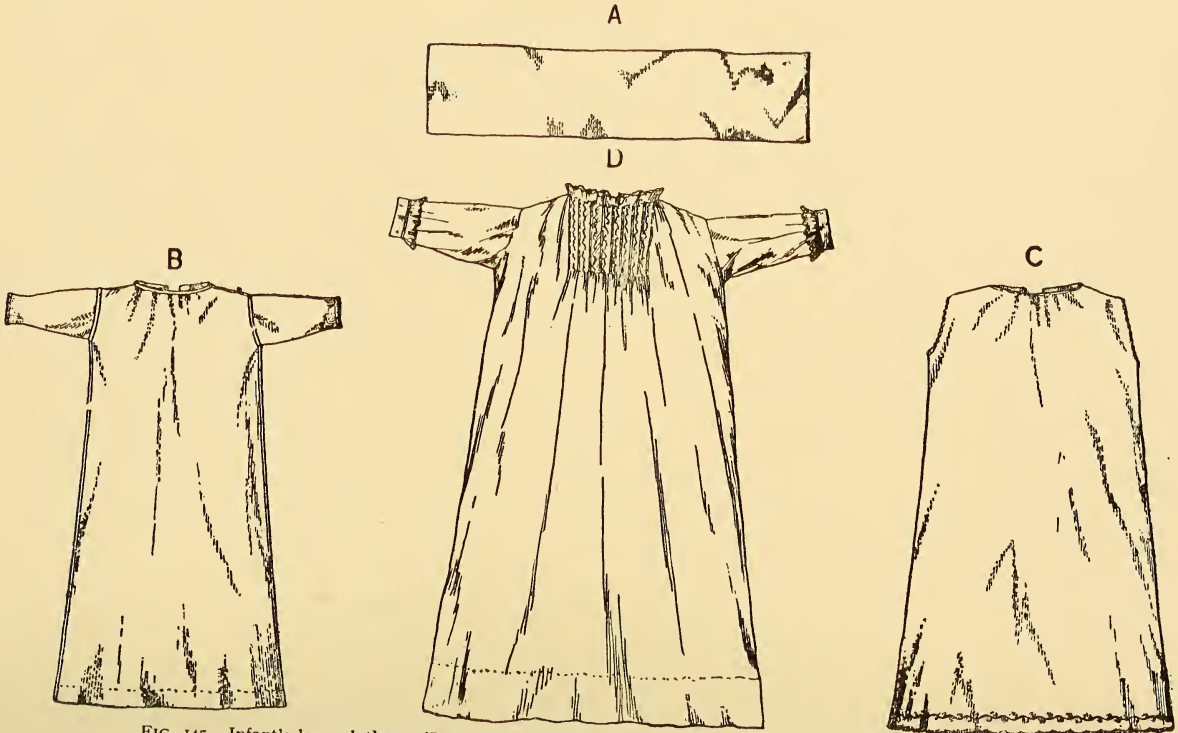


FIG. 145.—Infant's long clothes. (Rotch.) A, abdominal band; B, undershirt; C, petticoat; D, slip or dress.

After this has been accomplished, usually in about ten or twelve days, the mother or other attendant should be instructed to repeat the process two or three times a week for several months, or until the parts are entirely healed, to prevent the formation of new adhesions and to permit of the thorough cleansing of the glans and the removal of the curdy secretion called *smegma* which is formed in considerable amount.

Adhesions between the prepuce and the glans penis are very common, and are a frequent cause of many of the nervous disorders of infancy and childhood. If the nurse has, at the outset, any difficulty in drawing back the prepuce she should consult the physician, but after the glans has once been fully exposed there will be no further trouble.

Soap or soapy water should never be used for bathing the denuded and delicate tissue of the glans penis, but the parts should be cleansed and the smegma removed with warm salt solution or a weak solution of listerine.

Similar adhesions are often found about the *clitoris* in female infants, but their destruction is not so easily accomplished, and should be left entirely to the physician.

" Scalding" or chafing of the buttocks (*intertrigo*) is always the result of neglect to change the diapers and cleanse and powder the delicate skin as often as necessary, and no properly qualified nurse will ever permit such a condition to arise in a child under her care. Neglect of only a few hours is enough to start up irritation of this kind, and occasionally, when the nurse is out or resting and the child is in the care of some member of the family, the mischief will be done.

Whenever redness of the buttocks appears the use of soap and water on the inflamed skin is to be discontinued at once, and the parts are to be cleansed only with warm sweet oil and dusted carefully with talcum powder, so that no vestige of moisture is present at any time. This will usually check the inflammation, and the skin will return to its normal healthy condition, but if the irritation continues and the chafing grows worse instead of better it should be brought to the notice of the physician, who will probably order some mild and soothing ointment.

Diapers that are but slightly damp with urine may be dried thoroughly and used a second time, but before they are used again they should be washed, boiled, and ironed properly. It is better, of course, to use only diapers that are fresh from the laundry, and this should be done as far as possible and always if there is any irritation of the skin.

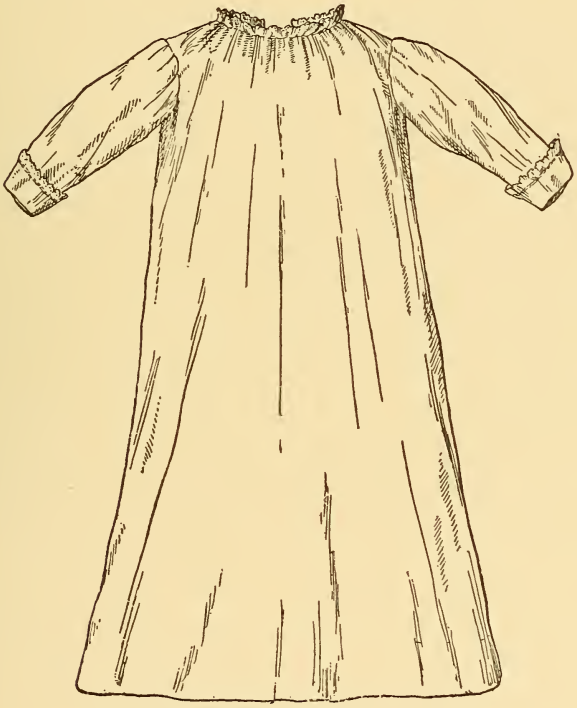


FIG. 146.—Infant's night-gown. (Rotch).

Carelessness in cleansing the scalp will result in the condition known as *seborrhœa capitis,* which consists of an over-secretion of the sebaceous glands, mixed with dirt, forming a yellowish-brown, waxy-looking crust on the head. This will never occur if the child is properly cared for, and when the condition is encountered the crusts should be gradually softened with warm

sweet oil and removed as gently as possible, after which, if the head is kept clean, there will be no return of the trouble.

The newly born infant requires a great deal of sleep, and is to be kept in its bed or bassinette except when it is removed for some special purpose, such as nursing or bathing. At a regular hour every evening, just before a nursing period (preferably a little before five o'clock), it is to be undressed completely and attired in its night-gown (Fig. 146) for the night. This garment is made of stockinet or flannel, according to the season of the year, and, like the other clothing, opens in the back. It is worn until the daily bath next morning, which is best given just before the eleven o'clock feeding.

The infant will, during the first few weeks of its life, sleep practically all of the time, but it must be expected to cry vigorously for at least half an hour each day in order to expand its lungs and develop the muscles of its chest and abdomen. It should be laid down at once after each nursing, so that it may go to sleep and digest its food properly, and if it cries, and examination shows that it is perfectly clean, dry, and comfortable, it should be left alone to stop of its own accord, and never patted, rocked, or walked with. If possible the child should be kept in a room away from the mother until after the puerperium, in order that this process of disciplining may not disturb her rest and make her nervous.

Systematic training of this kind during the first few weeks of the puerperium, coupled with a regular hour for undressing the baby and putting it to bed in a dark room for the night, will teach any child to go to sleep the moment it is laid in bed, and the habit will cling to it as long as the rule is rigidly enforced. If the plan is to be successful, it must be adhered to absolutely, and friends and relatives of the family must understand clearly that they cannot see the baby under any circumstances after five o'clock.

There is not a healthy child living who has to be rocked or otherwise cajoled to sleep whose parents or nurses are not directly responsible for the whole matter, and while it may be very entertaining to ignore the welfare of the infant entirely and

make a toy of it at first, the constant care and attention become most trying as the years go by, and especially so if other children are born and brought up in the same way. A child can be made a comfort just as easily as a trial and burden, and people whose children are up at all hours of the night, have to be rocked to sleep and stayed with for hours each evening, and protected from bogie men and other terrors of the nursery, have absolutely no one but themselves to blame.

The fewer visitors allowed to see the baby the better, and these can only be admitted in the daytime. The child should never be "played with" by any one until it is at least six months old, and it is much better if it can be spared all excitement of this kind until it is in its second year.

In these matters of discipline the nurse can only advise the parents as to the best course to pursue for their own personal comfort and the good of their child, but if they prefer to make themselves and everybody about them miserable for a number of years rather than forego an ill-timed frolic with the baby, they cannot be denied the pleasure of doing so.

The temperature of the nursery should be kept at about 70° F., and marked variations must be carefully avoided. The air must be kept pure and sweet at all times, and this is best accomplished by placing a board four inches wide under the lower sash of one of the windows and lowering the top sash about half the distance, to allow for the escape of impure air, as shown in Fig. 143.

The room should be at the upper part of the house, to avoid the dampness from the ground, and a sunny exposure should be had if possible. There should be no unnecessary hangings or furniture to collect dust and bacteria, and rugs are far better than carpets.

The time when the baby can go out of doors depends upon the time of year, the weather, and the climate of the place of its birth. Babies born in the summer or in a warm climate may usually go out on dry, pleasant days when they are four or five weeks old, provided they are kept in the sun with their faces shielded from the light. Infants born in the winter or in a severe

climate are better off in the house, even up to the fourth or fifth month, but they should receive fresh air once or twice daily by being bundled up warmly and carried into a good-sized room with open windows, where they may remain for ten or fifteen minutes.

The directions for nursing are given in detail in Chapter XXV., and it must not be forgotten that the baby requires a drink of tepid boiled water several times daily. This is best given very slowly with a medicine-dropper, and when the infant cries persistently between nursing periods a little water given in this way is often all that is necessary to quiet him at once.

The umbilical cord usually separates from the body between the fifth and eighth day after birth, but its detachment may be delayed until the tenth, twelfth, or even fourteenth day without causing any harm unless signs of inflammation appear. The nurse will usually find the cord in the umbilical dressing when she removes the binder to give the baby its bath, and there may be a slight stain of blood on the cotton. If the bleeding continues, as it may in *very* rare instances, the physician should be notified. In most cases the navel will be depressed somewhat and absolutely free from any evidence of inflammation. No further treatment is required except to keep the part clean and dry, but a small protective pad of cotton under the binder will do no harm and may be used for a week or two longer if it is desired.

XXIII

The Premature and Feeble Infant

THERE are three essential factors in the management of an infant that is puny and feeble, whether its low vitality is due to prematurity or to other causes operating on a full-term child. These are: to maintain its body temperature; to provide nourishment which it can assimilate readily; and to insure its absolute rest and quiet at all times.

The best indication of an infant's ability to fight its own battles after birth is its *weight*. The mere fact that the child is born prematurely is of little consequence when compared with the number of pounds that it weighs, and a premature infant of five pounds will, in general, require no more care and attention than a full-term baby that weighs the same.

The warmth of the infant's body may be kept up in two ways; either by wrapping the child in a cotton jacket or by placing it in an incubator.

As a safe general rule for guidance it may be said that babies weighing between four and a half and five and a half pounds are to be wrapped in cotton instead of being regularly dressed, while those weighing less than four and a half pounds should be placed in the incubator; and even larger children whose temperature is subnormal often do better in the cotton jacket.

As soon as a small, feeble child is born it should be well anointed with *warm* olive oil or albolene, wrapped in *warm* cotton and surrounded with hot-water bottles. The cord must be tied with special care, and is to be inspected for bleeding at frequent intervals, for there is a well-marked tendency to secondary hemorrhage in this class of cases.

As soon as the nurse has finished with the toilet of the mother she is to make a jacket of cotton and gauze in the following manner. A piece of gauze, shaped like the pattern

(Fig. 147), is procured, basted to a sheet of absorbent cotton about half an inch thick, trimmed roughly into shape, and cut out on the lines indicated. The infant is wiped dry with pledgets of *warm* cotton and the vernix caseosa removed carefully, espe-

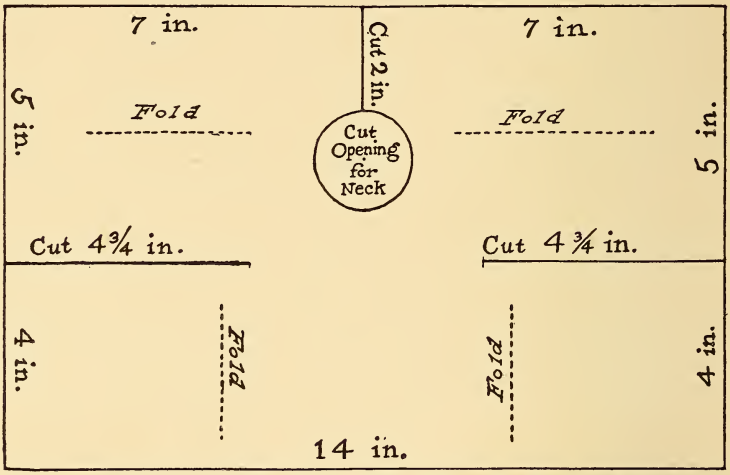


FIG. 147.—Pattern for improvised cotton jacket. Baste gauze of the above dimensions to one layer of cotton. Cut out on the solid lines as indicated and fold on the dotted lines.

cially from the axillæ, groin, and other places where it is most abundant. It must be remembered that there is more vernix caseosa on a premature infant than on a full-term child. The cord is dressed, a soft flannel binder applied, and the infant's body again carefully anointed with fresh *warm* oil or albolene. A small diaper is to be used, and this is best made of lintine, or pieces of an old soft napkin or table-cloth. The ordinary "bird's-eye" diaper cloth, if new, will be found too stiff, and the diapers themselves, if made for a full-term child, too large; but old diapers may be torn into small pieces and answer as well as either of the other materials.

The jacket is now to be warmed thoroughly, laid on the nurse's lap, or on a pillow, with the cotton side up, and the infant, clad only in binder and diaper, placed on it. The edges of the garment are next to be brought together in front, over

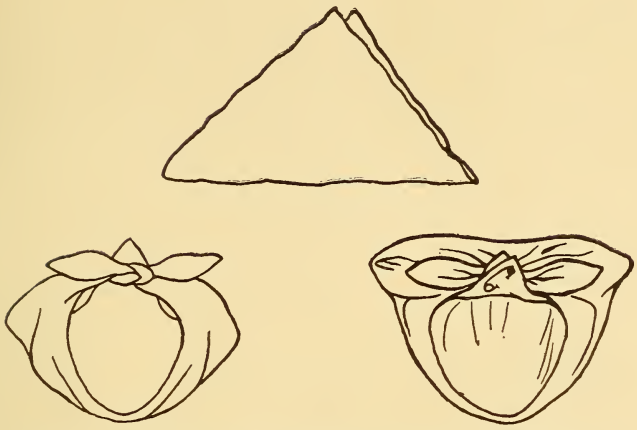


FIG. 148.—Improvised turban of gauze and cotton for premature infant.

FIG. 149.—Improvised cotton jacket, blanket, and turban. Small full-term infant dressed for purposes of illustration only. Compare Fig. 154.

the body and arms, and "caught" lightly but quickly with needle and thread (Fig. 149). The baby's feet may be encased in moccasins or bootees of flannel or knitted material, and the skirt of the jacket must be folded very lightly, so that it will not in the slightest degree interfere with the free movement of its legs. Its head must be protected from cold by means of an improvised hood or turban (Fig. 148), made of a square piece of gauze folded over a triangular piece of cotton and applied as shown in Fig. 149.

If the child weighs *four and a half pounds* or more, it need only be dressed in the cotton jacket described above and placed in a basket or box (a bureau drawer will answer in an emergency) and surrounded with hot-water bottles (Fig. 150). Care

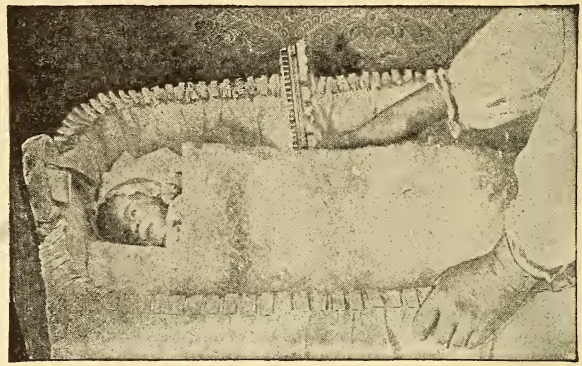


FIG. 150.—Infant premature at twenty-eighth week. Birth-weight, two pounds six and one-half ounces. Age, fourteen weeks. Treated in basket heated by hot-water bottles. Temperature of air in basket shown by thermometer introduced between the side of the basket and the blanket. (Rotch.)

must be taken that the bottles are not too hot or laid too near the infant, for a burn can easily occur in cases of such low vitality.

The basket or box containing the infant is to be placed in a quiet corner of the room, shielded from the light, and no visitors of any kind can be allowed to see the child, for any such disturbance and excitement is sure to be detrimental.

If the baby weighs *less than four and a half pounds,* an incubator should be purchased or rented and the child, dressed as above, placed in it at the earliest possible moment.*

The principle of all incubators is the same, the only difference being in the construction of the various kinds. It has long been known that the air surrounding a premature infant must be kept exceptionally warm, and formerly this was accomplished by heating the room occupied by the child to a stifling temperature, to the great discomfort of the nurse or other attendant.

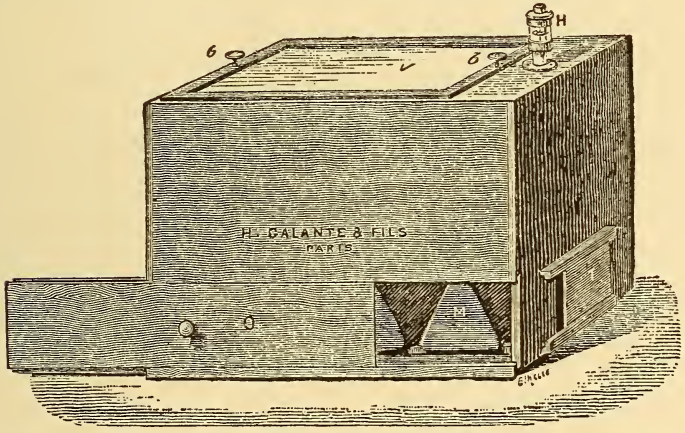


FIG. 151.—Tarnier's incubator, exterior. (Tarnier and Budin, l. c.) O, opening full length of box closed with a board that can be pushed to either side; M, so-called monk, a bottle of earthenware; T, cover over opening at end of box, shorter than aperture which admits air; V, glass cover; *b*, *b*, buttons by which cover is easily lifted; H, wheel revolved by escaping air.

The incubator is nothing but a minature room in which the infant can lie, and is so arranged that its temperature can be raised to any desired degree, while its interior can always be inspected through a glass in the top (Figs. 151 and 152). Beyond this ability to control the temperature perfectly the only

* A modification of the Auvard incubator, known as the "Cooke incubator," has been devised by the author and is manufactured by Knauth Brothers, 220 Fourth Avenue, corner Eighteenth Street, New York, from whom it may be either rented or purchased.

other essential feature of a satisfactory incubator is the apparatus which provides for its thorough ventilation.

The incubator is usually heated by means of hot water, and this either circulates through a system of pipes, one portion of

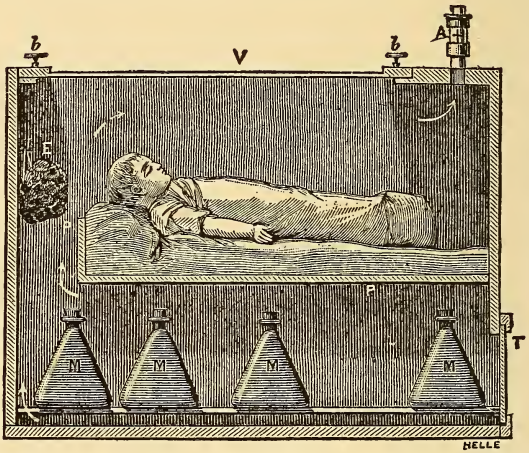


FIG. 152.—Tarnier's incubator, interior. E, wet sponge; P, partition between lower and upper compartments; A, tube for escape of air; T, M, V, *b*, *b*, as in Fig. 151.

which is exposed to a gas or alcohol flame, or the hot water is placed in tanks or bottles in the lower part of the incubator (Fig. 153) and renewed as often as it cools. In hospitals,

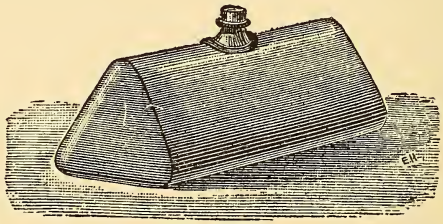


FIG. 153.—Hot-water jug.

where there is a steam-heating apparatus, the incubator is often a stationary one, with its steam or hot water coil attached directly to the heating apparatus of the institution, but in private practice a movable incubator must necessarily be used.

The child lies on a shelf or platform, padded thickly with cotton, about six inches from the floor of the box and directly over the coil of pipe or the cans containing the hot water.

Fresh air enters at the bottom, circulates around the heating apparatus, where it is raised to the proper temperature, passes over the shelf on which the infant rests, and escapes through a ventilator at the top. This ventilator is provided with an anemometer, or small revolving fan, to show whether or not there is a free circulation of air. As the warm air escapes from the ventilator at the top of the incubator it will cause the anemometer to revolve, and this revolution will be continuous unless the circulation of air is interfered with or the anemometer is out of order. Consequently it must be most carefully watched, and if the motion of the little fan ceases or becomes irregular a prompt investigation must be made.

Another method of keeping track of the circulation of air within the incubator depends upon the appearance of the glass which covers the top. This should be clear and dry at all times, and if it becomes moist and cloudy on the inside it is proof positive that the ventilation is not good.

A wet sponge is to be kept in the incubator to moisten the air, but there must be a sufficiently rapid circulation to prevent any of the moisture from collecting on the glass.

A thermometer, of sufficient size to be read easily, is to be placed by the side of the infant in such a position that it can be seen clearly through the glass, and the temperature of the interior must be kept between 88° and 92° F. and with as little variation as possible. It is best to start at 92°, and then reduce the temperature very gradually and evenly to 88°, reaching this point by the end of about a week and holding to it for several weeks longer, as the physician may direct.

Sudden changes in temperature must be avoided absolutely, and thermometer and anemometer be watched constantly.

As the cry of a premature infant is very feeble at best, it is often quite inaudible when the child is shut up in an incubator, and the closest attention must be paid to the condition of the baby at all times.

Many persons are of the impression that once the child is placed in a good incubator no further special precautions need be taken, but this is a most mistaken idea. Premature or underdeveloped infants require the most solicitous care in every way, and to merely keep them at a proper temperature will avail nothing unless the other details of their management are carefully carried out.

Rest is a most important factor in the rearing of such children and they must be shielded from excitement and every disturbing influence. Visitors invariably flock to see an unusually small child, and an "incubator baby" will be sure to attract a crowd of curiosity seekers as soon as its existence becomes known. The nurse must positively refuse to let any one see the child except the members of its immediate family, and these favored few can only be allowed occasional and very short glimpses.

All manipulation of the baby must be avoided except for absolutely necessary purposes, such as changing its clothing, administering nourishment, altering its position, or cleansing its body.

Light is to be curtailed by placing a shawl or other piece of dark cloth over the glass top of the incubator, and loud or sudden noises must be forbidden.

The skin, in these cases, is extremely delicate and tender, and diapers must be changed the instant they become wet or soiled, or severe "scalding" will occur within a few hours.

The child is not to be *bathed* except as is necessary for cleanliness, and when the diapers are changed the buttocks must not be washed with soap and water, but wiped carefully with cotton dipped in warm oil or albolene and then dried with cotton alone.

The *cotton jacket* is to be changed twice daily, care being taken that the fresh one is warm and ready for instant use the moment the old one is removed.

As soon as the nurse can spare the time from her other duties a more workmanlike jacket of cotton and gauze is to be made for the infant, and the hastily improvised turban is to be replaced

FIG. 154.—Premature infant (about seventh month) properly attired in cotton jacket and hood, and removed from incubator only long enough to be photographed; weight, two pounds three and one-half ounces; present age, five days. Case of central placenta prævia, seen in consultation with Dr. E. C. Pixley, of New York City.

by a properly constructed hood (Fig. 154). As a great many jackets and hoods will be required by the child before it is strong enough to give them up entirely, a good supply should be provided in order that fresh clean ones may be had at a moment's notice.

The *weight and temperature* of the child are both matters of the greatest importance, for, as in the case of any baby, if the child loses weight and its temperature goes up, it is an evidence that its food is either insufficient or of improper quality. The temperature is to be taken in the rectum and recorded on a chart every night and morning, and the weight is to be taken and carefully recorded once a day, at the time when the cotton jacket is changed. It is unnecessary to say that any rise in temperature or loss of weight must be reported at once to the attending physician.

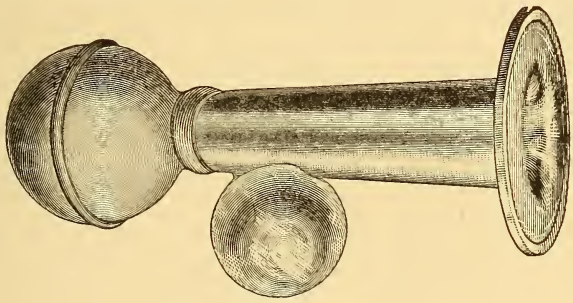


FIG. 155.—English breast-pump.

The best *food* for a premature baby is mother's milk, not only because it is especially adapted by nature to the needs of the child, but because it is very desirable to keep up the secretion of the mammary glands, so that, when the baby grows older and stronger, it can nurse directly from the breast.

The milk may be expressed from the breast with the hands or with a breast-pump, and is to be received into a perfectly clean cup and fed at once, before it has had time to cool.

The only breast-pump worth considering is that known as the "English breast-pump" (Fig. 155). This must be kept scrupulously clean and free from any curds or particles of sour

milk, and should be boiled at least once daily, and preferably each time it is used. The nurse must be very gentle in applying the breast-pump to the nipple, or the delicate tissues may be injured and much trouble result. After the nipple has been thoroughly cleansed, as for a nursing baby, the air is to be forced out of the bulb of the breast-pump and the bell placed gently but firmly against the breast so that the nipple comes exactly in the centre of the opening. The bulb is now allowed to expand slowly and gradually, and in a moment or two the milk will be seen to spurt out in two or three very fine jets. As soon as the bulb is fully expanded and full of air the pump is to be lifted from the breast, the bulb again compressed, and the bell again pressed firmly over the nipple as before. If for any reason it becomes necessary to remove the pump from the breast while it is still exerting suction on the gland, a little compression of the bulb will restore the pressure within the pump and it will come off of itself. Under no circumstances should it ever be pulled forcibly from the breast, and the use of the breast-pump should never at any time be painful to the mother. In some cases it will be found necessary to combine massage of the breast with the use of the pump, and if the milk does not flow freely when the pump is used the gland should be stroked gently and firmly with the finger-tips from the edges towards the nipple. Both breasts should be emptied at each feeding-time and the milk poured into a cup which stands in a basin of hot water, until enough is collected for one meal.

It seldom happens that a premature baby is strong enough to nurse from a bottle, and the milk must be fed with a spoon, a medicine dropper, or some other appliance that will do away with all effort on the part of the child.

Dr. Breck has devised a "feeder" for premature infants (Fig. 156) consisting of a graduated glass tube with a small rubber nipple at the smaller end and a rubber finger-cot at the larger. The cot serves as an air reservoir, and, when the nipple is placed in the infant's mouth, slight intermittent pressure on the cot will enable the child to get the milk without any effort whatever beyond that of swallowing.

To fill the " feeder" the nipple and cot are removed, a cork fitted snugly in the smaller end, and the proper quantity of milk poured in through the larger opening. The cot is then attached to the top, the " feeder" inverted, and, after the cork is removed, the nipple is slipped over the smaller end.

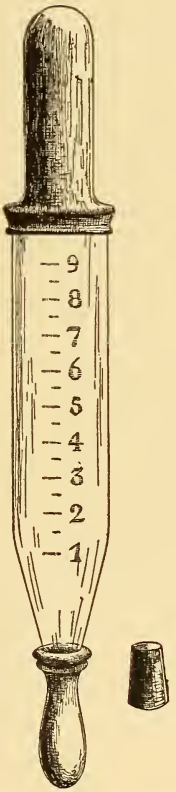


FIG. 156.—Feeder for premature infant. (Rotch.)

The amount of milk for each feeding should at first be from two to three drachms, and the food should be given as often as every hour during the day and every two hours at night.

The care of the breast-pump and nursing-bottle, or " feeder," whichever is used, is of the utmost importance, for, if germs

of any sort are allowed to collect in them, the milk will be contaminated and the life of the infant will be greatly endangered. The cot and nipple are to be cleansed with soap and water inside and out, rinsed thoroughly, and boiled for five minutes before each feeding. The bottle, or glass portion of the "feeder" or breast-pump, must also be cleansed with the greatest care by scrubbing, rinsing, and boiling.

It is well to have a number of "feeders," bottles, nipples, and cots, so that several of each may be boiled at one time and kept in sterile boric acid solution until they are needed.

When mother's milk cannot be secured, cow's milk, modified in the manner described in Chapter XXV., must be given; but the physician must always regulate the strength and quantity of the food, for the problem of feeding a premature child with artificial nourishment presents many difficulties, and is too serious a matter for the nurse to undertake on her own responsibility.

In general it may be said that the premature baby is to receive food of *half* the strength and in *half* the amount, but *twice* as often as would be given to a full-term child.

The feeding in every case must be regulated to meet the needs of the particular baby under treatment, but if the management is at all successful at the outset it will not be long before milk of the usual strength for a normal infant of corresponding age can be given with safety.

The nurse will often be asked if a premature infant will ever develop as well and be as strong and sturdy as one born at term. It may safely be said that if the child can be made to live and thrive during the first few weeks there is no reason why it should not ultimately be as robust and healthy as any other baby (Fig. 157).

FIG. 157.—Infant premature at thirty weeks. Birth-weight, four and one-quarter pounds. Treated in incubator sixty-four days. Age, nine months. Weight, seventeen and one-half pounds. (Rotch.)

XXIV

The Accidents, Injuries, and Diseases of the New-Born

The accidents that may occur at or shortly after birth include *asphyxia* and *hemorrhage* from the cord.

Asphyxia has already been discussed on page 210.

Hemorrhage from the cord may be *primary,* due to the slipping or loosening of the ligature, or *secondary* from the base of the cord when it separates from the body. In the first instance the bleeding is from the end of the cord and not from its base, and can be controlled by the proper application of a fresh ligature. The secondary hemorrhage, from the base of the cord, occurs at about the fifth to the eighth day when separation takes place. It is often preceded by a slight jaundice, and is not an actual flow of blood but a persistent oozing, which frequently resists every form of treatment until the infant dies in a condition of exsanguination. This variety of hemorrhage is of rare occurrence, and may be due to that peculiar condition known as the "hemorrhagic diathesis," in which the individual's blood shows no disposition to coagulate, and bleeding from any denuded surface is persistent and often profuse; or the child may be the subject of a syphilitic taint.

The treatment by the nurse of secondary hemorrhage from the cord consists in the application to the bleeding surface of a piece of cotton saturated with liquor ferri subsulphatis (solution of the subsulphate of iron, to be had of any druggist). The physician should be notified promptly, and if by the time he arrives the use of the styptic has not effectually controlled the oozing, he will doubtless pass two long needles at right angles to each other through the base of the umbilicus and apply a tight "figure-of-eight" ligature (see Fig. 97). The needles must be removed at the end of six or eight hours and an antiseptic dressing applied. If this form of bleeding is at all severe and persistent, recoveries seldom take place, and even if the umbilical

hemorrhage is controlled, bleeding may appear in the nose, mouth, stomach, intestines, or abdominal cavity; or the infant's body may develop purpuric spots at various points.

The INJURIES to the new-born infant are those which occur during labor, either from pressure or from manual or instrumental assistance to delivery.

Fracture of a long bone or dislocation of an extremity may be the result of a version, or may occur in a breech case with the arms extended above the head when they are brought down into the vagina. Fracture of the clavicle ("collar bone") or of the jaw, or dislocation of either of these bones, may follow forcible efforts to extract the after-coming head in cases of breech presentation. These cases, of course, can only occur when the physician is present, and their treatment rests with him entirely.

Fractures in the newly born infant usually heal rapidly, but it is often somewhat difficult to keep the parts in good position while repair is going on.

Dislocations should be reduced at once, or there will be great danger of permanent deformity in the joint.

Injuries to the head caused by the forceps usually disappear within a few days, even when they are quite marked at first. If there is actual laceration of tissue, which will only occur when the instrument slips, or if there is a destruction of tissue-vitality from very prolonged pressure, it is quite probable that permanent scars will remain. Neither of these injuries will happen when the instruments are judiciously used, and any scar that may result will be so small and faintly marked by the time the child is five or six years old that it will be scarcely noticeable.

Pressure from forceps may seriously affect the brain-tissue, causing paralysis of certain groups of muscles (Fig. 158), or an acute traumatic meningitis may develop; and the same conditions may occur when no instruments are used.

Prolonged pressure on the head during a protracted first stage, where the membranes rupture before the os is fully dilated, causes a swelling of the scalp at the point where it is encircled by the cervix. This is called "*caput succedaneum*" (Fig. 159), and in its milder forms is very common. It is due

to an extravasation of serum into the tissues of the scalp at the portion surrounded by the os and free from pressure, and

FIG. 158.—Facial paralysis of new-born child. (Ahlfeld.)

it is the more marked the longer the first stage is delayed. The portion of scalp rendered œdematous in this manner varies, of

FIG. 159.—Caput succedaneum. Male, two hours old. (Rotch.)

course, with the position and presentation, and the condition always disappears in a day or two without treatment of any sort.

Another swelling of the scalp which resembles caput succedaneum in certain respects is caused by an effusion of blood between the parietal bone of one side and the overlying scalp. This is seldom present when the child is born, and may not be noticed for two or three days, when the existence of a swelling will be observed, and it will be seen to increase gradually in size until about the seventh day after labor, when it remains stationary for a time and then slowly disappears. This condition is termed "*cephalhæmatoma*" (Fig. 160), and usually

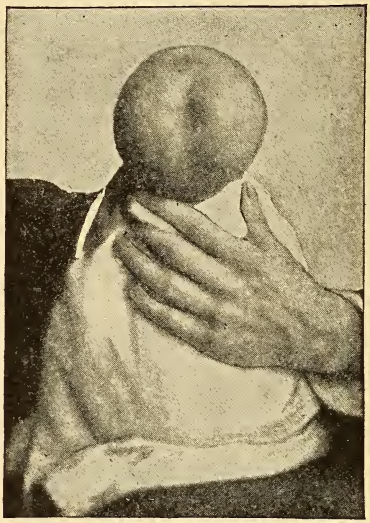


FIG. 160.—Double cephalhæmatoma. Infant four days old. (Rotch.)

ends in recovery without treatment. It may be due to pressure in normal labor, or by forceps, but it is also occasionally seen in breech cases in which no instruments were used nor prolonged pressure exerted on the after-coming head. These cases are not common, and require no further mention.

The DISEASES of the new-born infant are *ophthalmia, icterus, spina bifida, mastitis, vaginal hemorrhage* in female infants, *umbilical hernia, umbilical vegetations, congenital cyanosis,* and *tetanus.*

Ophthalmia neonatorum is a disease of the eyes characterized by a profuse purulent discharge due to infection from the genital canal at the time of birth and usually of gonorrhœal origin. The disease appears two or three days after birth, provided the infection occurred at this time, but as the septic matter may be introduced into the eye at a later period by dirty cloths and neglect of the proper care of the child, the onset of the trouble may be much later. Both eyes are usually affected, and they are first suffused with a watery discharge and somewhat congested. Within twenty-four hours the lids are very much swollen, and a thick, creamy, greenish pus is found under them. Later the swelling becomes so marked that the eyes cannot be opened at all, opacities of the cornea occur, the conjunctiva is ulcerated and then perforated, and the eye collapses and atrophies.

The *treatment* consists, first, in the use of a five per cent. solution of protargol dropped into the eyes immediately after the labor, and this should always be done as a preventive measure whenever there is any suspicion of gonorrhœal or other infection of the vagina. If the disease develops in spite of this prophylactic treatment, the infant is to be kept in a dark room and the eyes bathed at intervals of from twenty to thirty minutes with sterile ice-cold saturated solution of boric acid. Iced cloths must be kept constantly on the eyes until the inflammation has subsided, and when the boric acid solution is used the lids must be separated so that it will flow freely into the eye and reach every part of the diseased tissues. Whenever the iced cloths are changed or the boric acid is used fresh pieces of gauze must be employed and the old ones destroyed at once by burning. If opacities appear on the cornea in the form of small milky-white spots, the physician must be notified immediately, for, unless the most energetic measures are adopted without delay, the sight will be destroyed.

The nurse must remember that this is a distinctly infectious disease, and that there is extreme danger of conveying it to others and of setting up an acute infection in the maternal genital tract. Even the eyes of the nurse herself may become

infected unless she is most painstaking in her methods. The fingers should be covered with fresh sterile gauze when separating the lids, and thumb-forceps (Fig. 161) should be used for changing the iced cloths.

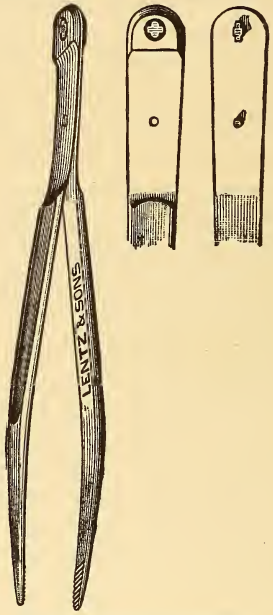


FIG. 161.—Thumb-forceps.

Ophthalmia neonatorum is a serious condition which may result in total blindness, but if suitable treatment is adopted at the very outset of the disease and intelligently carried out the sight can usually be saved. The entire treatment is, of course, under the direct supervision of the physician, and in severe cases he will often deem it best to call an oculist in consultation.

ICTERUS NEONATORUM (jaundice of the new-born) is a fairly common condition of somewhat uncertain origin, but believed by many to be due to infection at the umbilicus. It often appears in its milder forms among strong, healthy infants, the yellow color of the skin showing first on the second or third day and increasing in intensity until the ninth or tenth, when it begins

to disappear. No treatment is required unless the infant shows symptoms of severe constitutional disturbance, and in the vast majority of cases a favorable outcome may be expected.

SPINA BIFIDA (Fig. 162) is due to the congenital absence of one or more vertebral arches, usually at the lower part of the

FIG. 162.—Spina bifida of dorsal lumbar region. Infant forty-eight hours old. Died when ten days old. (Rotch.)

spine. This allows the membranes covering the spinal cord to bulge outward, forming a soft fluctuating tumor filled with cerebrospinal fluid. The tumor is diminished by pressure and enlarges when the infant cries. The disease is usually fatal, although a certain few cases have been cured (Fig. 163). The most common outcome is ulceration of the sac followed by its rupture and the escape of its contents. Convulsions then occur, and death follows within a few hours.

When the tumor is very small and shows no signs of increasing in size, it may merely be protected from injury and infection by carefully applied dressings, but the more severe cases are treated surgically if at all.

MASTITIS (inflammation of the breast) is occasionally seen in very young infants of either sex. The affected breast becomes swollen, tense, hot, red, and painful, and the disease usually appears during the first two or three weeks of life. The breast

is to be anointed gently with camphorated oil and protected from injury by a soft, loose, cotton dressing. In other respects it is to be left severely alone, and under no circumstances should

FIG. 163.—Spina bifida. Spontaneous cure. Male, four and one-half years old. (Rotch.)

it be squeezed, rubbed, or massaged. Nearly all cases will recover without any trouble, but if, as may possibly happen, an abscess should form, it is to be treated surgically.

A VAGINAL DISCHARGE of blood is not an uncommon occurrence among female infants, the flow appearing a few days after birth, and usually causing the parents considerable anxiety. It is of no consequence whatever, and will disappear of itself in a few days without any treatment.

UMBILICAL HERNIA (rupture at the umbilicus) may appear during the first few weeks of life, but usually not until a later period. The tumor may be made to disappear entirely on pressure, and reappears when the pressure is removed and the child cries.

The treatment consists in reducing the hernia and applying a well-padded hernia button (Fig. 164) about the size of a

FIG. 164.—Hernia button.

half-dollar, which acts as a truss and is held in place by two strips of adhesive plaster crossed in the centre (Fig. 165). In

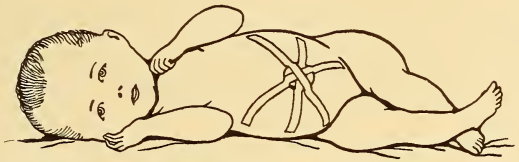


FIG. 165.—Method of attaching hernia button. Usually two strips are enough, and they may be cut much shorter than is indicated in the illustration.

the absence of a regularly made hernia button, a half-dollar or a large bone or wooden button, padded well with flannel, may be used.

If the hernia can be controlled perfectly for six months a cure will result. When the button is removed to be cleaned continuous pressure must be maintained with the finger until the pad is replaced and properly secured. Great care must be taken to prevent irritation of the skin by the plaster, and the "Z-O" plaster, manufactured by Johnson & Johnson, will be found the least likely to cause trouble.

Umbilical vegetations are sometimes seen after the cord has separated, in the form of little red friable tubercles varying in size from that of a pin-head to that of a large pea. The vegetations bleed readily, and are merely redundant granulations and of no special consequence. The physician can usually cure them promptly by removal with scissors or cauterization with nitrate of silver ("lunar caustic").

Congenital cyanosis occurs in those cases known popularly as "blue babies," and manifests itself at any time from a few hours to a few weeks after birth. The infant's body and, especially, its face and extremities acquire a dusky bluish or purplish hue, which may be almost imperceptible when the child is resting, but which is very marked after exertion of any kind.

The condition is due to a congenital defect in the circulatory apparatus, usually in the heart itself, which interferes with the flow of blood through the lungs, and so deprives the infant of its proper amount of oxygen.

Most of the cases die in early infancy, although some may live to be ten or twelve years old.

The only treatment is that directed towards the comfort of the little sufferer, and consists of inhalations of oxygen to relieve urgent symptoms, and rest, quiet, good hygienic surroundings, and nourishing food of a simple character. Brandy or other stimulant may be given when the dyspnœa is severe, but no treatment can have any curative effect, and the disease will always prove fatal eventually.

Tetanus is a very rare disease in this country. It is due to the action of a special germ, the *bacillus tetani,* which in the newly born infant enters the system through the umbilicus.

The disease begins between the third and tenth day after delivery, and the first symptom noticed is a stiffness of the muscles of the face and an inability to nurse or swallow. This is followed by a contraction of the muscles that control the jaw, causing *trismus* or "lockjaw," and within ten or twelve hours the spasm extends to the muscles of the neck and back, causing *opisthotonos,* or a rigid arching backward of the body so that

it can rest on the neck and heels with the trunk and limbs above the level of the bed (Fig. 166).

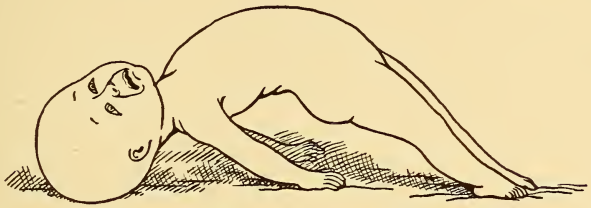


Fig. 166.—Opisthotonos. The characteristic convulsion of tetanus.

As a rule, death occurs within twenty-four hours, but if the child can be made to live for a few days it may possibly recover.

If an epidemic of tetanus is prevalent in any locality, it is best for a prospective mother to go to some other place which is free from the disease, for her confinement.

The treatment rests wholly with the physician, and, as the patient is unable to swallow, all drugs must be given hypodermically. The child must be disturbed as little as possible, for any sound or movement aggravates the condition.

Tetanus antitoxin, if it can be secured, combined with stimulants and opiates, and chloroform by inhalation when the spasms occur, are the only means we have for combating the disease.

XXV

Infant Feeding

THE best food for a baby is that designed for it by nature,—BREAST MILK. The *best* breast milk is that furnished by the infant's own mother, and the *next best* is that from another woman acting as a wet-nurse.

If the child's mother is unable to supply milk of a proper quality and in sufficient amount for its needs, and if the services of a suitable wet-nurse cannot be secured, the next best food is COW'S MILK, properly modified to meet the requirements of the child.

Whenever the mother is able to do so she should nurse her infant as far as she can, and then make up the deficiency with modified cow's milk; for even a limited quantity of breast milk is better for the child than none at all, and the effect of nursing not only stimulates the breasts to the production of better milk from day to day, but greatly aids the process of involution by which the uterus and other pelvic organs return to their normal condition after labor.

Breast milk is to be preferred to any modified milk, no matter how carefully prepared, for the reason that it is exactly what the child requires, while the other is at best only an imitation; it is absolutely free from germs, while cow's milk always contains a certain number of bacteria; it is delivered to the child in proper quantity and at a proper temperature, while bottle food may escape through the nipple either too rapidly or too slowly, and is often too hot at the beginning of a feeding and too cold at the end. Moreover, the bottles and nipples are apt to become sour even when the utmost attention is given to their care; the quality of the milk is always liable to vary; and errors not infrequently occur in the preparation of the food.

Hence we have to consider *four* distinct methods of feeding, named below in the order of their respective values:

1. Mother's milk.
2. Wet-nurse.
3. Mixed feeding. (Partly breast milk and partly modified cow's milk.)
4. Artificial feeding. (Modified cow's milk exclusively.)

Mother's Milk.—Before we can expect a mother to furnish good milk for her infant we must see to it that her breasts are in the best of condition for performing their functions (Fig. 167). This necessitates the adoption of measures early in preg-

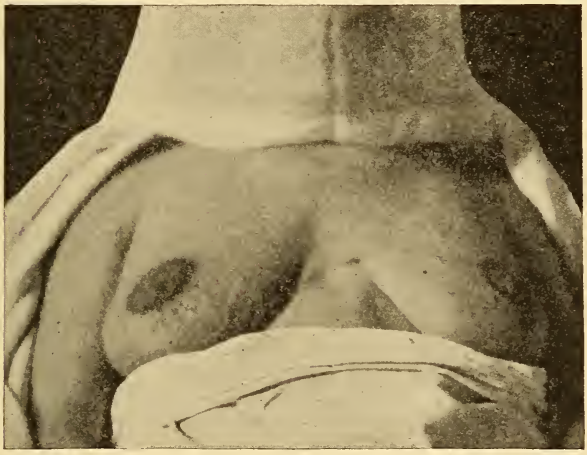


Fig. 167.—Soft, flabby breasts. Not well adapted to nursing.

nancy that will prepare the mammary glands for the work that lies before them. These measures have already been discussed in the chapter on the Management of Pregnancy, but will be reviewed here briefly.

The breasts should be bathed night and morning with soap and tepid water, to keep the skin in good condition, and rinsed after each morning bathing with cool or even cold water, according to its effect on the patient, to stimulate the activity of the glands. During the last two months of pregnancy the nipples are to be anointed with white vaseline or albolene every night, and this is to be washed off carefully in the morning to remove

any crusts of dried colostrum that may have formed. This drying of colostrum on the nipples is one of the most potent factors in the causation of soreness or tenderness of these organs, and the daily application of the vaseline or albolene effectually prevents the colostrum from "crusting" and so irritating the delicate tissues of the parts. If the nipples are short or flattened, they should be drawn out with the thumb and forefinger every night and morning and held in this position for at least five minutes. This simple procedure, practised regularly twice daily during the last eight or ten weeks of gestation, will often work wonders with nipples so small or flat that nursing is, at first, apparently out of the question.

The condition of the woman's general health has much to do with her ability to furnish good milk, and it goes without saying that corsets or other garments that compress the chest will interfere seriously with the development of the breasts.

Assuming that everything is favorable for nursing, the child is not to be put to the breast until the mother has had a good rest from the effect of her labor, and, if possible, not until after she has had a nap of a few hours. Usually the baby can begin its nursing about four or five hours after birth, after which it is to be put to the breast regularly, every four hours, day and night for the first two days. During this time the breast secretes nothing but colostrum, a laxative substance containing practically no nourishment whatever. If the infant does not seem satisfied with this diet of colostrum, the nurse may give it a five per cent. solution of milk-sugar made up with boiled water. One teaspoonful of sugar to twenty of water makes the solution in the required proportion, and it is best given in an ordinary two-ounce vial fitted with a small rubber nipple (Fig. 168). If a small enough nipple cannot be obtained, one may be improvised by taking the rubber cap of a medicine dropper and piercing it with a good-sized needle.

At or about the end of forty-eight hours the true milk begins to appear in the breast, and the infant should now be nursed every two hours from six A.M. to ten P.M., with one night feeding at two A.M. This plan gives the mother two uninterrupted

periods of four hours each for sleep, and it is to be adhered to until the child is six weeks old, after which the intervals

FIG. 168.—Two-ounce vial with nipple. For administering nourishment, water, or sugar solution to a very young infant.

between the feedings can be increased gradually until the fourth month is reached, when the night feeding can often be omitted entirely.

For convenience of reference the hours for nursing may be tabulated as below:

First two days	Every four hours.
Third day to sixth week.	2, 6, 8, 10, 12 A.M. 2, 4, 6, 8, 10 P.M.
Six weeks to ten weeks	2.30, 7, 9.30, 12 A.M. 2.30, 5, 7.30, 10 P.M.
Ten weeks to four months	2.30, 7, 10 A.M. 1, 4, 7, 10 P.M.
Four months to nine months	7, 10 A.M. 1, 4, 7, 10 P.M.

Of course, different meal-times might be chosen with the same intervals between, but the hours given are those which are least likely to interfere with the meals and other affairs of the

household. Nurses, and physicians as well, will find it a great convenience to adopt the same feeding hours for all infants coming under their professional care, for this plan will do away entirely with the possibility of any confusion or misunderstanding as they go from one family to another. The child can easily be " started" at six o'clock every morning for the first six weeks, and this will bring the other meal-times right for the entire day. Afterwards the mother may be allowed to sleep until seven o'clock before the regular daily programme is begun.

The care of the nipples and of the infant's mouth, both before and after nursing, is of the utmost importance, for dirty nipples are the most common cause of infection of the breast, and also infect the baby by setting up disease of its mouth and digestive tract; while a dirty mouth is almost certain to cause disease of the nipples. Immediately before and after each nursing the entire breast is to be bathed gently with tepid water and a little castile soap, and the nipple washed off with alcohol (ninety-five per cent.). Also, the infant's mouth is to be wiped out very gently with warm boiled water, applied with a soft piece of gauze wrapped over the end of the forefinger. A solution of boric acid or of borax may be used for this purpose, but in the writer's opinion the boiled water answers perfectly well. The utmost gentleness must be exercised in cleansing the infant's mouth, for the tissues are extremely delicate, and if any force is used abrasions may be caused which may afterwards serve as starting-points for infection.

The effect of the warm water on the breast is to favor the flow of the milk in the first instance, and after the nursing is over it adds greatly to the comfort of the patient by removing any of the secretion that may have trickled down over the skin. The alcohol (itself an antiseptic) sterilizes and probably toughens the nipple, and as it evaporates almost instantly it cannot exert any harmful effect on the infant, as might be the case with ordinary antiseptic solutions made up with more or less poisonous drugs. The cleansing of the infant's mouth is for the purpose of removing any curds or other substances that might, by decomposition, infect the nipple or cause trouble to the child.

When the true milk begins to appear in the breast (about the second or third day), the patient is apt to suffer somewhat from a feeling of fulness and tenderness in the distended organs. This can be relieved by the application of a well-fitted and fairly snug breast-binder (see Fig. 124), so adjusted that it will raise the breasts up on the front of the chest and prevent them from hanging down at the sides and "dragging." After the binder has been placed in position under the patient's back and is ready for pinning, the breast on one side is to be raised up as high as possible over the chest wall, a pad of absorbent cotton about the size of the hand placed at its outer side, and held in this position by the patient herself while the other breast is treated in the same way. This will bring the two breasts close together in the median line, with a deep furrow between them, and it is well to place a small strip of absorbent cotton in this depression between the organs to absorb perspiration and any possible excess in the secretion of milk. The milk at this time and for the next few days is apt to flow very freely and in much greater amount than is needed by the child, and other little pads of absorbent cotton should be placed over the nipples to take up the overflow and keep the clothing sweet and clean. These pads must be changed at very frequent intervals, for if any sour milk is allowed to collect it will not only tend to make the nipples sore, but it may seriously affect the child as well. The binder is, of course, to be unpinned for each nursing and replaced again as soon as the child is through and the breasts have been thoroughly cleansed. It can usually be discarded entirely after a few days, and it must be remembered that its only purpose is to support the breasts, and that if too snugly pinned it will compress the organs and interfere with their functions.

If the child is to nurse properly it must be properly held by the mother, and while most women seem to know instinctively how to support an infant at the breast, many are so awkward about it that definite instructions must be given them. First of all, the baby must be *comfortable,* and so placed that it can reach the nipple without any effort. Its head and shoulders should rest on the arm corresponding to the breast to be nursed,

and the mother's other arm should reach over the child's body so that the hand can support its back. This is much more easily managed when the woman is sitting up, but during the early days of the puerperium the patient is, of course, on her back in bed. At this time a small pillow placed under her elbow is of great assistance to her in supporting the weight of the child, and when she is able to be up she should use a chair with arms, on which she can rest her elbow or upon which a pillow or cushion can be placed when the infant is at its meal.

The child should be made to understand that it is to begin nursing as soon as it is put to the breast, and it should continue to nurse vigorously, with occasional brief rests for breathing, until its meal is finished, when it is to be removed at once and laid in its bed. A baby that "dawdles" at the breast, or one that is fretful and peevish, either is not hungry or there is some fault with the milk, the nipples, or with its own ability to nurse. In any event, such a child should be taken from its mother's arms as soon as a fair trial shows that it is not going to nurse properly, for it is the worst possible policy to keep a crying child at the breast for a long period when it is obviously unwilling or unable to take its nourishment. It should be kept away for a full interval, or until another feeding time comes round, when it will probably have learned what is expected of it and proceed to its duty properly and without delay.

If, however, it continues to refuse the breast after this has been done, the physician should be consulted. He may find that the quality or quantity of the milk is at fault, that there is trouble with the nipples, or that the infant itself is ailing in some way.

If everything is satisfactory the baby should nurse heartily at its regular meal-times, which, of course, grow farther and farther apart as the child's age increases. It should be hungry as each feeding time comes round, satisfy itself in at least twenty minutes, and at the end of the meal fall into a comfortable, drowsy condition or even drop off to sleep.

The infant should be weighed every day and its weight accurately recorded in pounds and ounces. It will be found that

during the first few days of its life it will lose weight in every case, because its food, being chiefly colostrum, contains very little nourishment and it is obliged to live on its own fat. This initial loss in weight is always to be expected, and usually amounts to about ten ounces, after which the child begins to gain, and should be back to its original birth-weight by the time it is ten days old. Thus there is a *normal* initial loss of ten ounces in weight, *normally* regained in ten days' time. From this time on the child should gain steadily from day to day, until at the age of six months it should weigh twice as much as it did at birth.

Besides gaining regularly in weight and strength, a baby should be happy and good-natured when awake, but inclined to sleep a good part of the time between nursings. It should be hungry at its proper nursing times, but not before, and its digestion should be perfect, as evidenced by the absence of vomiting and the passage of smooth, bright yellow stools entirely free from curds or mucus.

Vomiting must not be confused with "regurgitation," which is a purely normal process by which the stomach gets rid of an overload of food. *Vomiting* is always accompanied by the symptoms of nausea. It may occur at any time, but usually long after nursing. The child cries, grows pale, and even blue, about the mouth, develops a cold sweat on the forehead, and, with more or less effort, expels a quantity of sour, bad-smelling, curdled milk from the stomach. This process may be repeated at frequent intervals, and the child is evidently sick. *Regurgitation* occurs immediately after nursing *and at no other time.* The baby is bright and happy, and merely opens his mouth and lets the excess of milk run out on his dress. It is, in other words, nothing more than an *overflow,* and, far from doing the baby any harm, does him good by relieving his distended stomach. The milk is not sour, and the baby is obviously perfectly well.

Occasionally a child appears to be hungry between feeding-times, when in reality it is only thirsty, and it should be given small sips of tepid boiled water until it has satisfied its thirst.

There is no danger of giving it too much water, and it should be allowed to drink until it stops of its own accord.

In no case should the baby be put to the breast more frequently than at the regular feeding-hours already named, for a young infant requires nearly two hours in which to digest its food, and if it is nursed too often one meal will be taken into the stomach before the preceding one is digested, with the result that vomiting and indigestion will occur. As the child grows older it takes more milk at a nursing, and a longer period is required for the digestion of its food, so that the intervals between the nursings are necessarily lengthened. The point is to give its feedings far enough apart to allow the stomach a short period of rest before each nursing.

Usually the milk from one breast will be enough for a very young infant, in which case alternate breasts should be used for each nursing, but as the child grows older it will be necessary to put it to both breasts at every feeding. There is no harm in doing this at any time, provided the milk of one breast alone does not seem to be in sufficient quantity to satisfy the child.

The baby should never be played with or "stirred up" soon after a nursing, for such excitement will almost surely interfere with digestion and cause vomiting and other disorders of a serious nature. In fact, a child should never be played with at all until it is past six months old, but allowed to devote all its energies to eating, sleeping, and developing in every way.

When, after every precaution has been taken to secure proper milk for the child, the food still does not "agree," the trouble, if not with the child itself or with the condition of the nipples, can usually be traced to alterations in the QUANTITY or the QUALITY of the breast milk.

If the *quantity* is at fault, and the baby is not receiving enough nourishment, the following signs will serve to indicate the nature of the trouble:

1. The baby will wake before its regular nursing time and be obviously hungry. It will cry and fret, refuse water with

apparent disgust, and, when nursing is permitted, seize the nipple ravenously and nurse with great vigor.

2. It will continue to nurse long after the breast is empty, in its effort to secure enough food, and will cling to its mother and cry in a fretful way when an attempt is made to remove it from her arms. As has been said, a normal child, receiving normal milk, should be perfectly satisfied within twenty minutes at the most, after which it should drop the nipple of its own accord.

3. The breast itself, when examined just before a nursing hour, will not be full of milk as it should be, and on prolonged palpation it may be impossible to express any milk at all from the nipple. When the meal-time arrives the breasts should, under normal conditions, be firm and tense but never painful, and very slight pressure should be enough to cause the milk to escape in fine jets.

4. The child's weight will go down and its temperature will go up. In the chapter on the Care of the Normal Infant stress was laid on the importance of keeping a careful daily record of its morning and evening temperature taken in the rectum, for the onset of fever, coupled with a loss of weight, is one of the most significant indications that the amount of nourishment is not sufficient.

With these four points in mind, the nurse should have no difficulty in knowing when the amount of milk secreted is too small.

To increase the milk flow the condition of the mother's health should be looked into carefully, and she is to be shielded as much as possible from worry, grief, overwork, or other causes of low vitality. If coffee is included in her diet, it should be stopped entirely, for this beverage has a decided tendency to diminish milk secretion. She should drink milk, or cocoa, in its place, and extra milk should be taken between meals and at night before retiring. It must be remembered, however, that too much milk is apt to upset the stomach, especially in certain individuals, and lime water or vichy should be added to each glassful as a preventive against this form of gastric dis-

turbance. If symptoms of indigestion develop, the milk should be stopped at once, and dispensed with until the stomach is again in good working order.

Certain articles of food increase the milk flow to a marked degree, and among these may be mentioned *beets* and all kinds of shell-fish, notably *crabs*. The writer has had under his care, recently, a nursing woman who, after eating one or two soft-shelled crabs at night, would be obliged to put on a breast-binder before morning in order to relieve the tension in her breasts. Crabs and similar rich articles of food should never be given to the woman while she is still in bed, and none of the various drugs, supposed to increase the secretion of the breasts, should be administered except by order of the physician.

An excessive flow of milk is of rare occurrence after lactation is fully established, but when it does occur to such an extent that it soils the patient's clothing and keeps her in a constantly uncomfortable condition, it may often be checked by the administration of one or two cups daily of strong black coffee.

"Caked" breasts, popularly supposed to be due to over-distention with milk, seldom occur after the woman is up and about, and their treatment is discussed in the chapter on the Management of the Puerperium.

If the QUALITY of the milk is at fault the case will probably have to be referred to the physician.

Up to this time no mention has been made of the chemical constituents of milk, but unless a nurse has a fair knowledge of these matters she cannot understand the subject of infant feeding in an intelligent way.

Milk is a natural emulsion, and consists, roughly speaking, of thirteen per cent. of solids and eighty-seven per cent. of water.

The SOLID SUBSTANCES are *fat, sugar, proteids,* and *salts,* and of these it is only necessary to consider the first three, for the salts are unimportant in many ways and never vary to any great extent.

The *fat* of milk is in the *cream,* the *sugar* is the kind known as *"lactose,"* or *"milk-sugar,"* and the *proteids* make up the *curd.*

In good specimens of mother's milk there is, approximately, four per cent. of *fat,* seven per cent. of *sugar,* and two per cent. of *proteid.* It will be seen that this makes up the entire thirteen per cent. of solid matter, but, as a matter of fact, the true proportions are slightly less than the round numbers given, leaving room for a small percentage of salts.

Normal mother's milk, as it leaves the breast, is a sterile fluid, absolutely free from germs, blood-corpuscles, or pus-cells. It should have an alkaline, possibly neutral, *but never an acid,* reaction, and its specific gravity should be from 1027 to 1032. Colostrum cells should be absent after the twelfth day, and the fat cells should be small, numerous, and of uniform size.

The proteids of milk vary directly with the specific gravity, —that is, the higher the specific gravity the higher the proteids, and *vice versa.* If we know the amount of cream in a given specimen of milk, it is possible to make a fair estimate of the proteids in a very simple way. Professor Holt, of the College of Physicians and Surgeons, has devised a little apparatus, consisting of an hydrometer and jar, for ascertaining the specific gravity of milk, a pipette, and two long graduated cylinders with glass stoppers, for estimating the percentage of fat.

The milk to be examined is to be taken from the middle of a nursing, or, if it is removed from the breast artificially, after about half the entire amount has been extracted.

This milk is put into one of the glass cylinders with the pipette and should fill it exactly to the graduation marked O. If specimens from both breasts are to be examined at the same time, both cylinders are used. The cylinders, properly filled and securely corked, are set away in a temperature of 70° F. and left undisturbed for twenty-four hours, after which time the cream line will be distinctly visible and the percentage may be read on the scale. But this is CREAM and not FAT, which is to the cream as 3 is to 5. Thus, if a specimen of milk shows seven per cent. of cream, we have: Fat : 7 : : 3 : 5, or four and one-fifth per cent. of fat.

The estimation of the proteids is not quite so simple, but it is by no means difficult.

We can determine accurately the amount of fat in a given specimen, and fat, being the lightest part of the milk, tends to lower the specific gravity; so that the more fat in a specimen the lower the specific gravity would naturally be. Proteid, on the other hand, is the heaviest part of the milk, and the greater the percentage of proteid, the higher will be the specific gravity. Hence:

(*a*) If both fat and specific gravity are high the proteids must also be high, or the amount of fat will bring down the specific gravity.

(*b*) If the fat is low and specific gravity high, the proteids are probably about normal, the high specific gravity being due to the small amount of fat in the specimen.

(*c*) If the fat is high and the specific gravity low, the proteids are again probably about normal, the low specific gravity being due to the large amount of fat.

(*d*) If both fat and specific gravity are low, the proteids must also be low, for otherwise the small amount of fat would make the specific gravity high.

In collecting the milk for examination great care must be taken to handle it as little as possible, and the glass cylinders for making the cream tests must be scrupulously clean, or the milk may sour before the cream has had time to rise. If at the end of twenty-four hours the cream line is not sharply defined, the specimen may be allowed to stand six hours longer before the percentage is recorded.

Any marked variations in the proportions of fat and proteids, and the presence of any foreign substances in the milk, such as blood or pus, will cause, in the infant, indigestion of a more or less serious degree. The most common form of disturbance is that due to an increased percentage of proteids, and is evidenced by constipation and the presence of curds in the stools. If the condition is not corrected promptly, serious illness may result. When fat is present to an excessive degree the infant vomits and has diarrhœa. It is not difficult to keep these two sets of symptoms in mind when it is remembered that the proteids, being the curd of the milk, would, if in excess, naturally

cause curds in the stools; and that the fat, being an oil, would, if in too great amount, tend to the production of diarrhœa.

Both fat and proteids are increased by a diet that is largely of animal food and diminished by one consisting chiefly of vegetables. In cases where the proteids are in too great amount it might be possible to remedy the matter by putting the woman on a vegetable diet and then, if necessary, making up the deficiency in fat by giving her cream to drink.

Fright, worry, pain, or any other *nervous shock,* increases the proteids in the milk, and the patient must be shielded from these disturbances as far as possible.

Menstruation increases the proteids, but the increase depends largely upon the amount of pain that the woman suffers at this time. Not long ago it was thought best to stop nursing entirely if the menstrual function returned during lactation, but it has been found wiser to be governed by the amount of suffering that the woman undergoes, and not take the child from the breast unless the mother's pain is extreme and the infant plainly shows the effect of the change in the milk. Ordinarily it is better to let the baby undertake the extra digestive strain for a few days each month than to subject him to the greater risk of an entire change in diet.

The presence of *blood* or *pus* in the milk is an absolute indication for stopping all nursing at the affected breast. This condition is usually due to injury or inflammation of the breast, and if the milk remains after an apparent cure has been effected, the child must not be allowed to nurse until, by microscopic examination, it is known that all evidences of suppuration have entirely disappeared.

Pregnancy, when occurring during lactation, causes a marked decrease in the percentage of fat. It is another, and the only other, positive indication to stop nursing entirely. The milk is not good for the child, and the mother cannot properly nourish herself, her baby, and the fœtus in utero, while the reflex connection between the breasts and the uterus would make nursing under such conditions a very probable cause of abortion.

As has been said, the presence of blood or pus in the milk

and the occurrence of pregnancy are positive contraindications to nursing; any of the other conditions may or may not be, according as they can or cannot be corrected by diet or other treatment; and lastly, there are some women whose milk is apparently perfect in every respect and yet who cannot nurse their children because, from some unknown reason, the milk does not and cannot be made to "agree."

Wet-Nurse.—Theoretically the wet-nurse is the best substitute for mother's milk, but practically it is usually better to try "mixed feeding" or adopt artificial feeding entirely. The wet-nurse is not easily secured; she is expensive, and usually she is an extremely "cranky" and disagreeable person to have in the house, causing trouble with the other servants and making herself generally unpleasant in her assurance that the family will put up with anything rather than have the baby's food changed again.

The majority of wet-nurses are unmarried women secured from some public maternity hospital, as women with homes and husbands are not apt to neglect their own children in this way, and the probable, if not actual, lack of morality in the nurse is an added reason for making her an undesirable member of the family. *Aside from this,* however, an unmarried woman usually makes the best wet-nurse, not only because she parts with her own baby with little or no regret, but she has no husband to appear at frequent intervals and demand her wages or upset the entire household by threatening to take her away.

In selecting a wet-nurse a woman should be chosen whose baby is as nearly as possible of the age of the baby for whom her services are required. She should be a woman of neat and cleanly habits, and, preferably, one of more or less phlegmatic disposition, and both she and her child should invariably be seen and examined by the physician for evidences of disease of any and every sort.

As has been said, a single woman usually makes a better nurse than one who is married, and the fact that the married woman has lost her infant through death does not help matters any, for her grief will usually be enough to spoil her milk by increasing the proteids.

If the unmarried woman is physically all that could be desired, she should be given the preference, for the essential thing is to secure a good food for the baby without any regard to other considerations. The question is often asked if there is not danger that the baby will acquire the disposition and character of the wet-nurse, and the best answer is that the probabilities are exactly the same as that a bottle baby will take on the manners and morals of a cow.

Milk is milk, and if it agrees with the baby its source is a matter of no consequence whatever.

After the nurse has been selected and the baby given into her charge the general directions governing the feeding are the same as when the infant nurses at its mother's breast.

Mixed Feeding.—This is the method to be adopted when the mother has some milk, of good quality, but not in sufficient quantity to fully satisfy the child.

The hours for feeding, according to the age of the child, are the same whether the baby is at the breast or on the bottle, and if the mother has not milk enough to satisfy her infant at every feeding she can often skip one or two nursing hours and give modified milk in place of the omitted breast feedings.

This plan should always be tried when the quantity of breast milk is below normal and its quality is good, for, as has been said, it is better for both mother and child to have the breast milk utilized as far as possible.

The modified milk to be used in mixed feeding is prepared in the proportions suited to the age of the child and given in the same quantity that would be allowed if the baby were exclusively on the bottle.

Artificial Feeding.—This is a most important subject and one that can only be considered here as it may be applied to a normal and perfectly healthy infant.

The various patented baby foods will not be discussed in any way. Directions for their use go with every bottle, and while each one claims to be better than all the others, and proves its claims by the publication of pictures of fat and usually rhachitic babies, they are all more or less bad and of no real value except

in certain cases where they may be used by the physician's direction to tide over a period of travel or to increase the carbohydrates in a food greatly diluted to remove its proteids.

Condensed milk, like the patented foods, contains too much sugar and too little fat to give it any value except on occasions, and while it also makes fat babies, these children, like those fed exclusively on the advertised baby foods, have no real honest strength and are liable to break down in childhood at the first attack of any serious disease.

Mothers often point with pride to healthy grown children, and state that they were brought up on this, that, or the other food, but the fact remains that if they had been attacked by any serious disease of infancy they would have died, when babies fed on modified cow's milk might have weathered the gale without difficulty. The explanation is that these children were fortunate enough to escape any severe disease until they had been on a general diet long enough to enable them to resist it. That the "baby-food babies" are fat is merely because sugar makes fat, and these foods are chiefly composed of sugar, which is necessary as a preservative, just as the housewife adds sugar to her "preserves" to keep them from spoiling.

Goat's milk and ass's milk are not worthy of consideration, although it is true that their constituents approach more nearly the proportions of breast milk than do those of cow's milk. The objection to their use lies in the fact that they are not easily obtained, and that even if they can be had they are not exactly the same as mother's milk and must be modified with as much care and attention as is paid to the preparation of cow's milk.

The only milk worthy of serious consideration as a substitute for breast feeding is that obtained from a herd of healthy cows. The milk from one cow, so long regarded as best for bottle feeding, is no longer used. It was formerly supposed that "one cow's milk" was less liable to change than that from mixed milkings, but it is now known that while the milk from a herd preserves a very constant average of quality, that from one cow is always subject to marked change.

The milk sold in bottles in the cities is usually of fairly good

quality, owing to existing laws regulating the management of dairies and the shipment and sale of milk. The best bottled milk to be had in New York is that known as "certified" or "guaranteed," milk and sold by certain dealers only. This differs from ordinary bottled milk only in that it is milked, shipped, and sold strictly in accordance with suggestions made by a committee appointed by the New York County Medical Society to investigate the milk supply of the city. Ordinary bottled milk may be up to all the requirements of a good food, or it may not, but certified milk can always be relied upon in every way. If the child is at all feeble, or, in any event, if the parents can afford the slightly additional expense, certified milk should be used instead of the ordinary kind.

It has been said that mother's milk contains, approximately, four per cent. of *fat,* seven per cent. of *sugar,* and two per cent. of *proteids.*

Mixed cow's milk—that is, milk which has been stirred up, so that any cream which may have risen is thoroughly mixed with the rest of the milk—contains, approximately, four per cent. of *fat,* four per cent. of *sugar,* and four per cent. of *proteids.*

At first sight it would seem that the only necessary step in modifying cow's milk to meet the requirements of an infant would be to dilute it one-half with water, giving *fat,* two per cent.; *sugar,* two per cent.; and *proteids,* two per cent.; and then adding two per cent. of *fat* and five per cent. of *sugar* to make the formula read, *fat,* four per cent.; *sugar,* seven per cent.; *proteids,* two per cent. This formula, from a *chemical* stand-point, is exactly the same as that of mother's milk, and it would be a proper food for the baby were it not for the fact that the proteids of cow's milk differ materially *in point of digestibility* from those of breast milk and must be greatly diluted before a young infant can assimilate them. By the time the child is about three months old its system has become accustomed to the proteids of cow's milk, the proportions of which have been gradually increased from day to day until, by this time, the formula is the same as that of mother's milk.

To prepare milk for an infant under three months of age we find that it is most convenient to use, as a basis, cow's milk containing twelve per cent. of *fat,* four per cent. of *sugar,* and four per cent. of *proteids.* This is called "*twelve* per cent. milk," or "12-4-4 milk."

To prepare food for a baby between the ages of three and nine months it is most convenient to use cow's milk containing eight per cent. of *fat,* four per cent. of *sugar,* and four per cent. of *proteids.* This is called "*eight* per cent. milk," or "8-4-4 milk."

Ordinary mixed cow's milk, containing, as has been said, four per cent. each of fat, sugar, and proteids, is called "*four* per cent. milk," or "4-4-4 milk."

To make "eight per cent." or "twelve per cent." milk it is only necessary to add to ordinary mixed (4-4-4) milk the required amount of fat in the form of cream.

Cream is nothing more than milk containing an excess of fat, and is of two kinds,—"gravity" cream and "centrifugal" cream.

"*Gravity*" cream is that which rises to the top of a milk-bottle, or which, in the country, may be skimmed from the milk-pans. It contains fat, sixteen per cent.; sugar, four per cent.; proteids, four per cent.

"*Centrifugal*" cream is that made with a centrifugal machine, and is sold in the cities in small sealed bottles as "cream." It is about as thick as honey, and contains fat, twenty per cent.; sugar, four per cent.; proteids, four per cent.

The problem now is to make either "eight per cent." or "twelve per cent." milk by the addition of the proper quantity of either "gravity" or "centrifugal" cream to ordinary mixed (4-4-4) milk.

These various formulas may seem a trifle confusing until they are placed in order, thus:

Fat.	Sugar.	Proteids.
4 per cent.	4 per cent.	4 per cent.
8 "	4 "	4 "
12 "	4 "	4 "
16 "	4 "	4 "
20 "	4 "	4 "

It will now be seen that *nothing varies but the fat,* and that the fat varies only in the perfectly regular progression of 4, 8, 12, 16, 20.

The first formula is that of ordinary mixed milk, and the next two are those of the desired products for use as the basis of the baby's food; while the last two are those of the perfectly familiar kinds of cream in every-day use.

In addition to the method of making "eight per cent." or "twelve per cent." milk by mixing cream and ordinary milk in proper proportions, the same results can be obtained by removing a definite amount of milk from the top of an ordinary quart milk-bottle in which cream has had time to rise. The method of removing this "top milk" and the amount to be removed will be taken up later.

Thus we have three methods at our disposal,—the use of "gravity" cream, of "centrifugal" cream, or of "top milk."

If "twelve per cent." milk is desired, it is made as follows:

From gravity cream, by adding one part of 4-4-4 milk to two parts of gravity cream, thus:

Fat.	Sugar.	Proteids.
16	4	4
16	4	4
4	4	4
3)36	12	12
12	4	4

From centrifugal cream, by mixing equal parts of 4-4-4 milk and centrifugal cream, thus:

Fat.	Sugar.	Proteids.
20	4	4
4	4	4
2)24	8	8
12	4	4

From top milk, by taking nine ounces from the top of the bottle as it comes from the dairy. The best way to remove the top milk is with the little dipper, holding exactly one fluid ounce,

devised by Dr. Henry Dwight Chapin and known as the "Chapin dipper" (Fig. 169). The first dipperful is to be taken

FIG. 169.—Chapin dipper.

off with a teaspoon, or the milk will slop over when the dipper is lowered into the bottle. It is, of course, distinctly understood that the milk is to be *dipped* out and not poured, for any tipping of the bottle will disturb the cream and alter the proportion of fat in the top milk.

This "twelve per cent." milk is now to be modified for the infant's use, and it is found most convenient to prepare twenty ounces of food each time in order to make the proportions come right.

It has been said, in speaking of breast milk, that it should be alkaline or neutral in reaction, but never acid. Cow's milk, as it reaches the consumer, is always acid, so that it must be made alkaline by the addition of lime water before it is fit for the baby's use.

The sugar in cow's milk (four per cent.) is normally much less than that in mother's milk (seven per cent.), and the addition of water, necessary to bring the fat and proteids down to a proper amount, reduces the sugar to almost nothing, so that sugar must be added to give sufficient sweetness to the food.

With "twelve per cent." milk as a basis, it is only necessary,

in preparing food for an infant under three months of age, to add lime water, milk-sugar, and water in proper proportions. The amounts of lime water and sugar do not change at all, but the milk is increased and the water proportionately diminished from day to day as the child grows older and is able to take stronger food.

Twenty ounces of food are made at each time, and for this amount one ounce each of lime water and milk-sugar are required. When the amount of "twelve per cent." milk suited to the age of the child has been added, enough boiled water is poured in to make the total amount of food exactly twenty ounces and the work is done, thus:

Lime Water.	Milk-Sugar.*	12% Milk.	Boiled Water.	Result.			Age.
				Fat.	Sugar.	Proteids.	
℥i	℥i	℥i	Up to	.60%	5%	.20%	Second day.
		℥ii	℥xx	1.20%	5%	.40%	Third to fourth day.
		℥iii		1.80%	6%	.60%	Fourth to seventh day.
		℥iv		2.40%	6%	.80%	Seventh to thirtieth day.
		℥v		3. %	6%	1. %	Second month.
		℥vi		3.60%	6%	1.20%	Third month.

It will be seen that the last formula in the above table, containing fat, 3.60 per cent.; sugar, six per cent.; and proteids, 1.20 per cent., is nearly the same as that of mother's milk (fat, four per cent.; sugar, seven per cent.; proteids, two per cent.); and beginning at about the fourth month the infant is usually able to take milk of the latter strength.

"Eight per cent." milk is used for making the 4-7-2 formula, merely because it is more easily managed than "twelve per cent." milk. Like "twelve per cent." milk, it may be made from gravity cream, from centrifugal cream, or from top milk.

* If milk-sugar cannot be obtained, granulated sugar may be used in its place. One fluidounce or one Chapin dipperful of granulated sugar equals one ounce in weight. Milk-sugar is lighter, and one and one-half fluidounces or one and one-half dipperfuls are required to make one ounce in weight.

From gravity cream, by adding two parts of 4-4-4 milk to one of gravity cream, thus:

Fat.	Sugar.	Proteids.
16	4	4
4	4	4
4	4	4
3)24	12	12
8	4	4

From centrifugal cream, by adding three parts of 4-4-4 milk to one of centrifugal cream, thus:

Fat.	Sugar.	Proteids.
20	4	4
4	4	4
4	4	4
4	4	4
4)32	16	16
8	4	4

From top milk, by removing with the Chapin dipper sixteen ounces of top milk from the full bottle.

To modify "eight per cent." milk for the infant it is only necessary to dilute it one-half with boiled water, which reduces the formula to *fat,* four per cent.; *sugar,* two per cent.; *proteids,* two per cent.; and then add five per cent. of sugar, which raises that ingredient to seven per cent. (5 + 2).

In preparing twenty ounces of food the exact formula is as follows:

Lime Water.	Milk-Sugar.	8% Milk.	Boiled Water.	Result.			Age.
				Fat.	Sugar.	Proteids.	
℥i	℥i	℥x	℥ix	4%	7%	2%	Fourth to ninth mouth.

One ounce of sugar to twenty of food is, of course, exactly five per cent. (one in twenty), and as one ounce of lime water is used, only nine of water are needed to bring the total quantity up to twenty ounces.

Having prepared the food properly, according to the age of the child, the next point is to ascertain how much is to be given at each feeding and how frequently the child is to be fed.

The hours for feeding are to be exactly the same as those for nursing at the breast, given on page 313, and the amount to be fed at each meal-time is as follows:

Second day	One-half to one ounce.
Third to thirtieth day	One to three ounces.
Second month	Three to four ounces.
Third month	Four to five ounces.
Fourth to ninth month	Five to six ounces.

It will be seen that, until the baby is about three weeks old, twenty ounces of food will last throughout the entire twenty-

FIG. 170.—The "Sloane Maternity" measuring-glass.

four hours, but after this time it will be necessary to prepare twice the quantity, some of which will, at first, have to be thrown away. This double amount may be prepared at one time, or, if fresh milk is served twice daily, half may be prepared in the morning and the other half at night. Usually it is best to prepare the entire amount of food for the twenty-four hours at one time and keep it on ice until it is wanted. Food should never be kept over from one day to another, but a fresh supply should be made up each morning.

A convenient method of preparing milk in accordance with the foregoing formulæ will be found in the use of the SLOANE MATERNITY MILK SET,* arranged by Dr. Edwin B. Cragin, of New York, and consisting of a measuring-glass (Fig. 170) and a Chapin dipper (see Fig. 169).

The apparatus is used as follows:

1. Pour into the glass granulated sugar or milk-sugar up to the proper mark as indicated on the side.

2. Add one dipperful (one ounce) of lime water and mix by shaking the glass.

3. Add the required number of dipperfuls (ounces) of "twelve per cent.," or "eight per cent." milk according to the age of the child as already explained.

4. Fill the measuring-glass up to the top graduation (marked "20 oz. of food") with plain boiled water, barley-water, or oatmeal-water.

During the first month plain water is best, but afterwards barley-water may be used or oatmeal-water if the infant is very constipated.

BARLEY-WATER may be made of the whole barley or of barley flour as follows. *From whole barley:* Add two teaspoonfuls of washed pearl barley to a pint of water; boil down slowly to two-thirds of a pint and strain. *From barley flour:* Put two tablespoonfuls of barley flour into a quart saucepan with one and one-half pints of water; boil down slowly to one pint. Strain and allow the liquid to set to a jelly. When warmed for use it will return to a liquid.

OATMEAL-WATER is made as follows: Add one tablespoonful of well-cooked oatmeal to a pint of water; allow it to simmer slowly for an hour or two until a smooth mixture is obtained. Strain.

It is to be distinctly understood that the problem of feeding an infant on artificial nourishment is often a most difficult one,

---

* THE SLOANE MATERNITY MILK SET is manufactured and sold by James T. Dougherty, 409–411 West Fifty-ninth Street and 334 East Twenty-sixth Street, New York City.

and that the nurse must never attempt any important modifications of diet on her own responsibility, but report at once to the physician any unfavorable symptoms that may arise.

The next question to be considered is the method of administering the food. It is, of course, to be taken from a bottle through a rubber nipple, and the selection of a proper nursing-bottle and nipple are matters of no small importance.

The shape of the bottle should be such that every part of the inner surface can be reached with a swab or brush (Fig. 171).

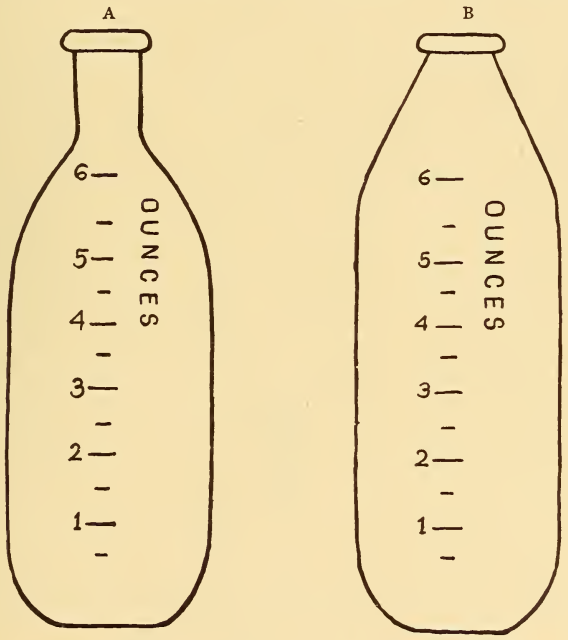


FIG. 171.—Nursing-bottles. A, improper pattern, with long, slender neck; B, proper pattern, without neck.

Bottles with sharp angles or broad shoulders should never be used, for it is impossible to clean them properly, and milk is very apt to collect and sour in their many nooks and corners.

The bottle should be graduated so that it need only be filled to the amount proper for a given feeding, and so that it will be

possible at all times to tell exactly how much food the infant has taken.

The best nipples are the plain ones of black rubber, but the most important point in the selection of a nipple has to do with the size of the hole through which the milk is to come. The hole is usually too large, and it is often best to buy nipples without any holes at all and make them of the required size with a needle.

The test consists in holding the bottle, filled with milk and with the nipple attached, upside down (Fig. 172). The milk

FIG. 172.—Testing size of opening in nipple. Milk should drop out as indicated, and not flow in a stream.

should escape drop by drop, and if it runs out in a stream the hole is too large. The objection to the large hole is that the child nurses too rapidly, and develops indigestion, colic, and other disorders.

The care of the bottles and nipples is another matter of the greatest importance, for if any sour milk is allowed to collect it will promptly sour fresh milk whenever it is used.

There should be as many bottles and nipples in commission as there are feedings in the twenty-four hours, so that no bottle will be used more than once in any day.

As soon as a nipple has been used it is to be washed thoroughly inside and out with castile soap and hot water, and a needle or bristle passed through the hole in the end to force out any little curd which may have lodged there. It is then put in a cup containing fresh saturated solution of boric acid. Once daily all the nipples are to be boiled for fifteen minutes.

There should be two cups of boric acid solution, and in the morning all the nipples, freshly cleaned and sterilized, are placed in one. Afterwards, as the nipples are used, and after they have been washed, they are placed one by one in the other cup until all are transferred, when they are again boiled and made ready for the next day. Fresh solution should be used each day, and the cups must be covered with saucers or napkins to keep out dust and other foreign matter.

The bottles, as has been said, must be so modelled that every part of the interior can be reached with a brush or swab. After each feeding the bottle is to be washed with castile soap and hot water and wiped inside and out, so that no vestige of milk or milkiness remains. It is then rinsed thoroughly with fresh water and placed on end to drain. Once in every twenty-four hours all the bottles are to be boiled. To prevent breakage they should be filled with cold water and placed in a vessel containing cold water, which is then brought to a boil. After boiling vigorously for not less than fifteen minutes the vessel is taken from the fire and allowed to cool until the bottles can be removed without scalding the hand. To attempt to cool them by the addition of cold water would be sure to crack some, if not all.

When the baby is fed, it must be supported in a comfortable position, and the bottle is always to be held by the mother or nurse in such a way that the nipple will be full of milk. The child should never be put to bed with the nipple in its mouth, and, as in breast feeding, it should never be allowed to dawdle over its meal. If a fair trial shows that it is not anxious for its food, the bottle should be taken away and not offered again

until the next meal time. If the infant persistently refuses to take its food there is usually something wrong with the milk, and the physician should be consulted.

Only the proper amount of modified milk for one feeding should be put in the bottle, and it should then be warmed to body temperature by placing the bottle in a vessel of hot water. In cold weather a piece of warm flannel may be wrapped around the bottle to keep the milk from growing cold towards the end of the feeding. Under ordinary circumstances, a normal child should take the entire quantity of food prepared for one feeding, and if any is left over at the end of the meal it should be thrown away and never returned to the main supply.

As a rule, city milk of good quality is so carefully cared for from the time it is milked until it reaches the consumer that, if put on ice at once, it will keep sweet for the entire twenty-four hours, but in very hot weather, or when the food has to last for a journey of several days, the milk will turn sour, even on the ice.

In such cases it becomes necessary to treat it in a way which will destroy the germs of fermentation and so keep the milk sweet. This is done by heating the milk to such a degree of temperature that the fermentative organisms will be destroyed. This, in its most primitive form, is accomplished by the familiar process of "scalding" the milk, so commonly done by poor people who buy cheap milk which is so old that it is just at the turning-point when they get it.

Sterilization is a process which was once in great vogue for preserving milk for the use of infants. This consists in placing the milk in a "sterilizer" (Fig. 173) and surrounding it with live steam for a definite period of time, which raises the temperature to 212° F. It is true that sterilization destroys all the germs in the milk and keeps it sweet for a long period, but it has the disadvantage not only of altering the taste to a decided degree, but of making the product much more indigestible than "raw" milk. On this account milk is not sterilized as much as formerly, for under ordinary circumstances it is safer to take the slight risk of infection from the comparatively small number

of bacteria to be found in good milk than to subject the child to the greatly increased difficulties of digesting sterilized milk.

FIG. 173.—Steam sterilizer. (Arnold.)

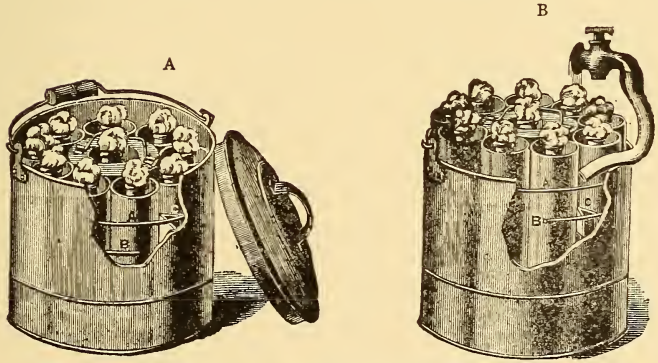


FIG. 174.—Freeman pasteurizer.

Another reason, however, has done more than anything else to do away with the use of sterilized milk, and this is the discovery

that if the milk is subjected for a considerable period of time to a temperature of 167° F. (instead of 212° F.) it will be sufficiently "sterilized" for all practical purposes, without undergoing any alteration in taste or increase in indigestibility.

This process is known as PASTEURIZATION, and is accomplished as follows:

The "pasteurizer" * (Fig. 174) is a large tin or copper pail with a cover, containing a rack which holds the nursing bottles. The rack consists of a number of water-tight cylinders, each large enough to admit a bottle, and the pail is so constructed that the rack may rest on the bottom and the cover be tightly adjusted, or, with the cover off, the rack may be raised up and secured in such a way that the tops of the bottles are about two inches above the top of the pail.

The bottles are those to be used for the feedings, and are graduated in ounces and half-ounces. As many bottles as there are to be feedings in the twenty-four hours are filled with properly prepared milk up to the proper graduation mark, so that each bottle will contain one feeding and no more. They are then stoppered with ordinary cotton wadding (not absorbent cotton) and placed in the cylinders. Cold water is poured in each cylinder around the bottle, and any empty cylinders are filled with water. Each cylinder is to be filled, and the water should not be colder than runs from the faucet.

The pail, without the rack and bottles, is now filled with water up to the rim on the inside and set on the stove to boil. As soon as it is boiling furiously it is removed from the fire and set on the table or floor, but never on iron or stone, which would abstract the heat too rapidly.

The rack and bottles are lowered at once to the bottom of the pail, the cover adjusted snugly, and the apparatus left undisturbed for three-quarters of an hour exactly.

At the end of this time the pail is placed in the kitchen sink

---

* THE FREEMAN PASTEURIZER is manufactured and sold by James T. Dougherty, 409-411 West Fifty-ninth Street, and 334 East Twenty-sixth Street, New York City.

or in some other convenient place, the rack raised up and secured so that the tops of the bottles will be above the top of the pail, and cold water allowed to run in and out, around the cylinders and overflowing the sides of the pail, until the milk is thoroughly cool.

The bottles are now placed on ice, and as each feeding time comes round, one is taken, the cotton stopper removed, the nipple attached, and the contents warmed for the infant's use.

This milk should be used the same day that it is prepared, but it will keep sweet for three or four days.

In general, "raw" milk is better for the baby than milk that has been "cooked," and the nurse should never suggest sterilization or pasteurization on her own responsibility, but consult the physician if such a process seems to be indicated.

When, for any reason, it is necessary to remove the child from the breast, and the glands are still secreting milk, it will be necessary to "dry up" the milk. As a rule, the physician will give directions for this, but it occasionally falls to the lot of the nurse to attend to the matter herself.

The breasts should be emptied as completely as possible, either by massage or with the breast-pump, the ingestion of fluids restricted to the smallest amount consistent with ordinary comfort, and the snuggest kind of a breast-binder applied and left undisturbed for three or four days. There should never be any fever, or pain in the breasts, but when the binder is removed the glands will be found somewhat hard and lumpy. This should disappear in the course of two or three days more, and the breasts appear soft and free from any trace of milk.

Drugs excreted by the Milk.—The *Journal of the American Medical Association* (November 1, 1902) publishes the following list of drugs which are excreted by the milk and which, consequently, affect the infant: Sulphur, rhubarb, senna, jalap, indigo, arsenic, bismuth, iron, mercury, potassium iodide, zinc, iodine, antimony, opium, oil of anise, oil of dill, garlic, castor oil, lead, oil of turpentine, oil of copaiba, all the volatile oils, magnesium sulphate (Epsom salt), carbolic acid, quinine, strychnine, and cascara sagrada. The article goes on to say, "The

elimination of these drugs by the milk is more liable to take place when the mother is in a disturbed condition physically and when the mammary glands are not in a normal condition. Consequently care must be observed in prescribing some of these preparations for the mother. For example, copaiba and turpentine will so affect the taste of the milk as to cause the infant to refuse the breast. Diarrhœa may be produced in the infant by administering castor oil or other of the above purgatives to the mother, and the opium preparations will produce the opposite effect on the child through the mother's milk. It is said that sufficient action may be produced on the child by administering mercury, arsenic, and potassium iodide to the mother."

XXVI

Maternal Impressions and the Control of Sex

By a "*maternal impression*" is understood an effect on the physical development of an unborn infant due to some shock, fright, accident, or other profound nervous strain sustained by the mother during the course of her pregnancy.

The possibility of phenomena of this kind is believed by a great number of individuals, among whom may be counted many of the highest intelligence, and children are frequently seen with birth-marks, harelips, supernumerary fingers or toes, and other deformities and disfigurements of various types, all of which are attributed to some form of nervous impression from which the mother suffered during the period of gestation.

It is safe to say, however, that the supposed connection between these unfortunate occurrences and any mental state of the mother may be traced to coincidences, or to the imagination, in every case, and the nurse should be informed on this subject in order that she may be able to reassure such expectant mothers as may be apprehensive that their children will be "marked."

The effects of heredity must not be confused with the subject under discussion, and it must be borne in mind that certain traits and characteristics and certain diseases may be transmitted from the mother to her unborn child. Also, a mother who is in a markedly debilitated condition, or one who is given to excesses of any kind, such as the habitual use of alcohol, morphine, or other drugs, cannot be expected to give birth to a healthy, robust infant, and, for this reason, such a parent may be the mother of a deformed, disfigured, or partially developed child.

Maternal impressions, however, are to be considered as supposedly affecting the physical development of the child as a result of a sudden profound shock transmitted entirely from without.

While, perhaps, it cannot be said that this is an absolute im-

possibility, it may be stated with the utmost positiveness that such an effect can occur no more easily *before* the birth of the infant than after it is in its mother's arms.

It will be remembered that the ovum in which the fœtus develops is nothing more than an *egg* of a peculiar kind, and that the child within it is, from the very first, an absolutely independent organism developing by itself, and not connected in any very intimate way with the mother. There is no mingling of the fetal and maternal blood-currents, and the blood of the fœtus merely gives up its waste products and takes on oxygen in the placenta as does that of the mother in her lungs.

The placenta is merely a thickened area in the sac formed by the amnion and chorion, and the whole may be regarded as the *shell* (soft, to be sure) of the *egg* in which the child is being formed. It is true that the placental structure penetrates to a certain depth into the tissues of the uterine wall, but it can no more be regarded as part of the maternal organism than can the roots of a tree be considered as part of the earth into which they extend.

Moreover, the umbilical cord, which is the only direct attachment of the fœtus to the placenta, *is absolutely devoid of nerves,* and no matter how much the placenta may be regarded as part of the mother, it is clear that there is no actual nerve connection whatever between the two.

In a word, the ovum, with its contained fœtus, merely finds in the uterus a suitable *nest* for its development, and it is a fact that, except for the practical difficulties in the way, no mother is absolutely necessary to the development of her child after conception has occurred. If we could solve the practical problem of transferring the fertilized ovum from the oviduct or uterus of one woman to that of another, *the process of development would go on just the same,* much as a hen's egg may be hatched by any hen or even in a purely mechanical incubator.

That this statement is not idle speculation is proved by the fact that, in Edinburgh within the last few months, two impregnated ova from a rabbit were transplanted to the oviduct of another rabbit of entirely different breed, and this second

rabbit eventually gave birth to two rabbits of the first variety, together with several others of her own kind. It should be said in explanation that both rabbits were impregnated at the same time by males of their own breeds, respectively, in order that the oviduct and uterus of the rabbit to whom the ova were to be transferred should be in exactly the necessary stage of gestational development.

Thus it will be seen that the connection between a fœtus and its mother is practically no more intimate before birth, while it lies in, and absorbs its nourishment from, her uterus, than after delivery, when it rests upon, and takes its nourishment from, her breast; and that the opportunity for nerve impulses to pass from one to the other is equally impossible in either case.

The question of the possibility of controlling the sex of unborn infants so that parents may beget male or female children at will has received much attention of late, and the nurse will often be interrogated in this connection.

The most recent teaching goes to show that, for the present at least, this is a matter entirely beyond the power of the human mind. None of the many theories and methods that have been advanced from time to time has proved in any way reliable, and where results may seem to have been secured the probability of coincidence must always be enough to overthrow any positive conclusions.

KEY TO PRONUNCIATION

Note that c and g have always their true historical sounds, the so-called "hard," as in *c*at and *g*o.

a as in *a*sk, f*a*st, ch*a*nt.
â as in f*a*r, *a*rm, c*a*lm.
ą as in sof*a*, Americ*a*, particul*a*r.
a as in h*a*t, m*a*t, m*a*n.
â as in b*a*re, h*a*re, f*a*ir.
ā as in Americ*a*n, republic*a*n.

e as in *é*gime, prostr*a*te, us*a*ge.
ê as in f*ê*te, f*a*te, *ei*ght.
e as in m*e*t, m*e*n, h*ea*d.
ė as in th*e*re, wh*e*re, b*ea*r.
ĕ as in f*e*rn, *ea*rth, b*i*rd.
ē as in bill*e*t, com*e*t, add*e*d.

i as in p*i*ano, med*i*al, stud*i*o.
î as in p*i*que, mach*i*ne, m*ee*t.
i as in p*i*t, p*i*n, beg*i*n.
î as in p*ie*r, p*ee*r, cl*ea*r.
ī as in ṣpir*i*t, necess*i*ty.

o as in *o*bey, p*o*tato, b*i*ological.
ô as in n*o*, n*o*de, s*ou*l.
o̧ as in act*o*r, adduct*o*r.
o as in n*o*t, *o*dd, wh*a*t.
ô as in f*o*rm, br*oa*d, f*a*ll.
ō as in at*o*m, gall*o*p.
ö as in German *Ö*the, *ö*tter.

u as in instr*u*ment, pr*u*dential.
û as in r*u*le, pr*u*dent, m*o*ve.
u as in p*u*ll, c*ou*ld, b*oo*k.
ŭ as in b*u*rn, c*o*lonel.
ʊ as in b*u*t, b*u*d, c*o*me.
ü as in German *M*üller, gr*ü*n, French j*u*s.

ai as in *ai*sle, *i*sle, b*i*te.
au as in F*au*st, h*ow*, n*ow*.
iu as in n*eu*trality, em*u*late.
iû as in f*eu*d, f*ew*, st*u*pid.
oi as in *oi*l, c*oi*n, b*oy*.
c (hard) = k as in *c*at, *k*ing, *c*hasm.
ch as in lo*ch*, German ko*ch*.
cw = qu as in *qu*een, *qu*it.
dh = th as in *th*ine, *th*is, smoo*th*.
g (hard) as in *g*o, *g*allon.
hw = wh as in *wh*ere, *wh*en.
j as in *j*aw, *j*udge, e*dg*e.
ng as in si*ng*, ba*nk*.
ñ (French) as in toñ, boñ.
s as in *s*on, *s*it, *c*ity.
sh as in *sh*all, ma*ch*ine, mo*ti*on.
th as in *th*in, brea*th*.
tsh as in *ch*urch, mu*ch*, wi*tch*.
z as in *z*one, mu*s*ic.
zh as in a*z*ure, cohe*si*on.

GLOSSARY

Note.—The definitions and pronunciations in this Glossary are taken, in the main, from Lippincott's Medical Dictionary. The references to illustrations refer to cuts and other figures in the body of the book.

Abdomen (*a*b-dō'mĕn). The belly.

Abdominal (*a*b-dom'*i*-năl). Belonging to or relating to the abdomen.

A. Delivery, delivery of the child by abdominal section. See *Cæsarean Section.*

A. Gestation, ectopic pregnancy occurring in the cavity of the abdomen.

A. Pregnancy. See *Abdominal Gestation.*

A. Section. See *Cæsarean Section, Cœliotomy, Laparatomy.*

Abnormal (*a*b-nôr'măl). Contrary to the usual or natural structure; contrary to the natural condition.

Abortifacient (ă-bôr-*ti*-fē'shi*ĕ*nt). 1. Causing miscarriage. 2. A drug capable of causing a miscarriage.

Abortion (ă-bôr'shŏn). The expulsion of the fœtus which is not viable; expulsion of the fœtus during the first three months of pregnancy.

Abrasion (*a*b-rē'zhŏn). 1. The fretting or rubbing off of a patch of skin or other covering. 2. A spot rubbed bare of the skin or nearly so. 3. Denudation by means of chemical action, or by a destructive disease-process.

Abscess (*a*b'*se*s). A collection of pus contained in a cavity formed in any part of the body by the disintegration and stretching of the tissue.

Acid (*as'i*d). 1. Sour, sharp to the taste. 2. Having the chemical properties of an acid.

Acid (*as'i*d). In chemistry, a compound having the property of combining with an alkali or a base and thus forming a new compound.

A. Reaction, a reaction by which litmus paper or solution is turned red by the addition of an acid.

Acme (*a*c'mĭ). The highest degree or height of a disease; crisis.

Accouchement (a-cûsh-mo*ñ*'). [French, *accoucher,* to put to bed, to deliver.] The act of being delivered; delivery.

A. Forcé, rapid delivery, artificially performed; as in cases of eclampsia or placenta prævia.

Accoucheur (a-cû-shĕr′). [French.] A male midwife; an obstetrician.

Accoucheuse (a-cû-shĕz′). [French.] A midwife.

Acute (ā-ciût′). Sharp-pointed; ending at a point or in an angle less than a right angle; severe, as *acute* pain. In medicine the term is applied to diseases having violent symptoms attended with danger and terminating within a few days.

Adnexa (*a*d-ne*c*′są). Appendages.

Uterine A., the Fallopian tubes and ovaries. (Fig. 11.)

After-birth (*a*f′tĕr-bĕrth). The structures cast off after the expulsion of the fœtus, including the membranes and the placenta with the attached umbilical cord; the secundines. (Figs. 21 and 22.)

After-pains (*a*f′tĕr-pênz). Those pains, more or less severe, after expulsion of the after-birth, which result from the contractile efforts of the uterus to return to its normal condition.

Albolene, Alboline (*a*l′bo-lîn). An oily substance resembling white vaseline.

Albuminuria (*a*l-biû-m*i*-niû′ri-ą). An albuminous state of the urine.

Alimentation (*a*l″*i*-m*e*n-tê′shōn). The act of taking or receiving nourishment.

Alkaline (*a*l′cā-lain or -lîn). Having the properties of an alkali.

A. Reaction, the reaction in which red litmus paper is turned blue by alkalies.

Alvine (*a*l′v*i*n or *a*l′vain). Belonging to the belly, stomach, or intestines.

A. Dejections, the fæces.

Amenorrhœa (*a*-m*e*n-o-rî′ą). Absence or stoppage of the menstrual discharge.

Amnion (*a*m′ni-*o*n). The most internal of the fetal membranes, containing the waters which surround the fœtus in utero.

Amniotic (*a*m-ni-*o*t′*i*c). Pertaining to the amnion.

A. Sac, the "bag of membranes" containing the fœtus before delivery.

Anæmia, Anemia (a-nî′mi-ą). Deficiency of blood in quantity, either general or local; also, deficiency of the most important constituents of the blood, especially the red blood-corpuscles.

Anæmic, Anemic (*a*-n*e*m′*i*c). In a state of anæmia.

Anæsthesia, Anesthesia (*a*n-*e*s-thî′zi-ą). 1. Loss of feeling or perception, especially loss of tactile sensibility. 2. The production of anæsthesia.

Anæsthetic, Anesthetic (*a*n-*e*s-th*e*t′*i*c). 1. Having no perception or sense of touch. 2. A medicine having the power of rendering the recipient insensible to pain.

Anæsthetist, Anesthetist (*a*n-*e*s′thi-t*i*st). A person who administers an anæsthetic.

Anchylosis (*a*ng-c*i*-lô′s*i*s). See *Ankylosis*.

Ankylosis (*a*ng-*c*i-lô'*s*is). The consolidation of the articulating surfaces of two or more bones that previously formed a natural joint; stiff joint.

Ante-partum (*a*n''ti-pâr'tum). Before delivery or childbirth.

Anterior (an-tî'ri-o̤r). Situated before or in front of.

Antiseptic (*a*n-ti-*s*e*p*'ti*c*). 1. Preventing sepsis or putrefaction. 2. A substance which prevents or retards putrefaction,—that is, the decomposition of animal or vegetable bodies with evolution of offensive odors. Among the principal antiseptics are: alcohol, creosote, carbolic acid, common salt, corrosive sublimate (bichloride of mercury), vinegar, sugar, charcoal, chlorine, boric acid, tannic acid, and benzole.

A. Dressing, a surgical dressing containing antiseptics.

A. Surgery, surgery with proper antiseptic precautions.

Anus (ê'nus). The external opening of the rectum.

Areola (*a*-rî'o-lą). The ring of pigment surrounding the nipple. (Fig. 36.)

Secondary A., a circle of faint color sometimes seen just outside the original areola about the fifth month of pregnancy.

Arterial (âr-tî'ri-āl). Belonging to an artery.

A. Blood, the bright red blood of the arteries which has been aërated (charged with oxygen) in the lungs.

A. Hemorrhage, hemorrhage directly from an artery.

Artery (âr'tē-r*i*). Any one of the vessels by which the blood is conveyed from the heart to the organs and members of the body. (So called because they were supposed by the ancients to contain air.)

Articular (âr-t*i*c'iu-lą̤r). Relating to joints.

Articulation (âr-t*i*c-iu-lê'shōn). The fastening together of the various bones of the skeleton in their natural situation; a joint. The articulations of the bones of the body are divided into two principal groups, — *synarthroses,* immovable articulations, and *diarthroses,* movable articulations.

Ascites (*a*-sai'tîz). An accumulation of serous fluid in the peritoneal cavity; dropsy of the peritoneum; dropsy of the belly.

Asepsis (*a*-*s*e*p*'s*i*s). The absence of septic materials; exclusion of disease germs and other causes of septic poisoning.

Aseptic (*a*-*s*e*p*'ti*c*). Not septic; free from septic matter; not exposed to the injurious effects of septic materials.

Asphyxia (*a*s-f*i*c'si-ą). Suspended animation; that state in which there is total suspension of the powers of body and mind, usually caused by interrupted respiration and deficiency of oxygen in the blood, as by hanging or drowning.

A. Neonatorum, A. Neophitorum, "asphyxia of the new-born," deficient respiration in new-born children.

Aspirating Needle (*a*s'*p*i-rê-t*i*ng). A hollow needle attached to a suction syringe for withdrawing fluid from the body. (Fig. 110.)

Assimilate (*ā*-s*i*m'*i*-lêt). To convert food into nutriment.

Astringent (*as*-tr*i*n'j*ē*nt). 1. Binding; contracting. 2. A medicine having the power to check discharges, whether of blood, of mucus, or of any other secretion.

Atrophic (*a*-tr*o*f'*ic*). Relating to atrophy; characterized by atrophy or failure of nutrition.

Atrophied (*at*'ro-fid). Affected with atrophy; wasted.

Atrophy (*at*'ro-f*i*). Defect of nutrition; wasting or emaciation with loss of strength, unaccompanied by fever.

Axilla (*ac*-s*il*'ą). The armpit.

Bacteria (b*ac*-tī'rią). The plural of *bacterium.* A form of microbes or vegetable micro-organisms.

Basiotribe (bê's*i*-o-traib). An instrument for crushing the base of the fetal skull. (Fig. 96.)

Basiotripsy (bê'si-o-tr*ip*-s*i*). The crushing of the base of the fetal skull with the basiotribe.

Bimanual (bai-m*an*'iu-*ā*l). Performed with or relating to both hands.

B. Palpation, examination of the pelvic organs of a woman by placing one hand on the abdomen and the fingers of the other in the vagina.

Birth (b*ĕ*rth). 1. The act of coming into life; the delivery of a child. 2. That which is born. See *Delivery.*

B. Mark, a "maternal mark" or "mother's mark," a mark on the skin from birth,—the effect, as some erroneously suppose, of the mother's longing for, or aversion to, particular objects, or of some accidental occurrence affecting her own person during pregnancy.

Bladder (bl*ad*'*ĕ*r). The urinary bladder; a thin distensible sac with membranous and muscular walls, situated in the anterior part of the pelvic cavity and acting as a reservoir for the urine secreted by the kidneys.

Bland (bl*a*nd). [Latin, *blan'dus,* agreeable.] Mild, soothing.

Bougie (bû'j*i* or bû-zhê'). A slender instrument primarily designed for introduction into the urethra. (Fig. 101.)

Breech (brîtsh). The nates or buttocks.

B. Labor or B. Delivery, labor or delivery marked by breech presentation. (Fig. 49.)

Cæsarean Operation, Cæsarean Section (sî-zê'ri-*ā*n). [From Julius Cæsar,—said to have been born this way; more probably from Latin *cæ'dere,* to cut.] The operation of cutting into the womb through the walls of the abdomen and removing a child when natural delivery is impracticable or impossible.

Capillary (*cap'i*-le-r*i* or *ca*-p*il'ā*-r*i*). 1. Resembling a hair in size. 2. Pertaining to a fine hair-like tube; pertaining to a capillary vessel. 3. One of the minute blood-vessels which form a net-work between the terminations of the arteries and the beginnings of the veins.

Caput (cê'put, Latin, *câ'put*). 1. The head, consisting of the cranium, or skull, and the face. 2. Any prominent object, like the head.

C. Incuneatum, impaction of the head of the fœtus in labor.

C. Succeda'neum, a dropsical swelling which appears on the presenting head of the fœtus during labor, caused by lack of pressure on that part. (Fig. 159.)

Carbohydrate (câr-bo-hai'drêt). Any one of a group of chemical compounds, most of which are the sugars and starches and important elements of food.

Caries (cê'ri-iz). [Latin, "rottenness."] 1. Ulceration of bone. 2. Decay of the teeth resulting in the formation of cavities.

Cartilage (câr'*ti*-lêj). 1. Gristle,—a pearly white, glistening substance adhering to the articular surfaces of bones and forming parts of the skeleton. 2. Any organ or part of an organ made up of this material.

Ensiform C. See *Ensiform.*

Casein (cê'si-*in*). The most important of the proteids of milk; constituting the basis of cheese in a state of purity.

Cathartic (*ca*-thâr'*tic*). 1. Purging or purgative. 2. A medicine which quickens or increases evacuations from the intestines, or produces purging.

Catheter (*cath*'e-tĕr). A surgical instrument like a tube, closed, but with one or more perforations towards the closed extremity, for passing into canals or passages,—used especially by introduction into the bladder through the urethra for the purpose of drawing off the urine. (Fig. 118.)

Caul (côl). A portion of the amniotic sac which occasionally envelops the child's head at birth.

Cell (*sel*). 1. Literally, a "cellar" or "cavity;" hence, any hollow space. 2. One of the minute masses of protoplasm of which organized tissue is composed.

Cephalic (*se*-fal'*ic*). Belonging to the head.

C. Pole, the cephalic extremity of a fœtus.

C. Presentation, presentation of any part of the fetal head in labor. (Figs. 41, 44, and 48.)

Cephalotomy (*sef*-*ā*-lot'o-mi). Dissection of the head; also the cutting or breaking down of the fetal head.

Cephalotribe (*sef'ā*-lo-traib). An instrument for crushing and extracting the fetal head in cases of difficult labor.

Cephalotripsy (sef''ā-lo-trip'si). The operation of crushing the fetal head with the cephalotribe.

Cerebrospinal (ser''i-bro-spai'nāl). Relating to the cerebrum and the spinal cord.

C. Fluid, the clear, limpid fluid contained in the ventricles of the brain, the subarachnoid spaces and the central canal of the spinal cord.

Cervix (sĕr'vix). The neck, more particularly the back part; also applied to those parts of organs that are narrowed like a neck.

C. Uteri, the neck of the uterus; the lower and narrower end of the uterus. (See Fig. 12.)

Chloasma (clo-az'mą). Pl. *chloasmata.* A cutaneous affection exhibiting spots and patches of a yellowish-brown color. The term chloasma is a vague one and is applied to various kinds of pigmentary discolorations of the skin.

C. Gravidarum, C. Uterinum, chloasma occurring during pregnancy.

Chorea (co-rī'ą). St. Vitus's dance; a convulsive disease characterized by irregular and involuntary movements of the limbs. It usually occurs in early life and affects girls more frequently than boys.

Chorion (cô'ri-on). The second, or most external, of the fetal membranes.

Chromicized Catgut (crô'mi-saizd). Catgut treated with chromic acid for use as ligatures or sutures.

Chronic (cron'ic). Long continued; lasting a long time; opposed to acute.

Cicatricial (sic-ā-trish'āl). Of the nature of, or relating to, a cicatrix.

Cicatrix (si-cê'trix). Pl. *cicatrices.* A scar; an elevation or seam consisting of a new tissue formation replacing tissue lost by a wound, sore, or ulcer.

Circulatory (sĕr'ciu-le-to-ri). Relating to, or affecting, the circulation.

C. System, the system of the animal body consisting of the heart, arteries, capillaries, and veins, through which the blood circulates.

Climacteric (clai-mac-ter'ic or clai-mac'tē-ric). A particular epoch of the ordinary term of life, marked by periods of seven years, at which the body is supposed to be peculiarly affected and to suffer considerable change; especially, the menopause or *grand* climacteric. The menopause or "change of life."

Clitoris (clit'o-ris). A small, elongated, erectile body at the anterior angle of the vulva. (See Fig. 8.)

Clonic (clon'ic). Applied to spasms in which the contractions and relaxations are alternate.

Coagulated (cô-ag'iu-lê-ted). Clotted.

Coaptation (cô-*ap*-tê'shōn). The fitting together of the ends of a fractured bone or the edges of a wound.

Cœliotomy (sî-li-*ot*'o-m*i*). Abdominal section; surgical opening of the abdominal cavity.

Collapse (c*o*-l*a*ps'). 1. A falling or caving in. 2. A state of extreme depression or complete prostration of he vital powers, such as occurs after severe injury or excessive bleeding.

Colostrum (c*o*-l*o*s'trum). A substance in the first milk after delivery, giving to it a greenish or yellowish color.

C. Corpuscles, large, granular cells found in colostrum.

Colpeurynter (c*o*l-piu-r*i*n'tĕr). A dilatable bag, used to stretch the vagina by introducing the bag in a flaccid condition and then distending it by the forcible injection of air or water.

Colpeurysis (c*o*l-piû'r*i*-s*i*s). Dilatation of the vagina by means of a colpeurynter.

Coma (cô'mą). A state of lethargic drowsiness, produced by compression of the brain and other causes.

Comatose (cô'mā-tôs). 1. Having a constant propensity to sleep; full of sleep. 2. Relating to coma.

Conception (cōn-s*e*p'shōn). The impregnation of the female ovum by the semen of the male, whence results a new being.

Congenital (cōn-j*e*n'*i*-tāl). Born with a person; existing from or from before birth, as, for example, congenital disease, a disease originating in the fœtus before birth.

Congestion (cōn-j*e*s'tshōn). An excessive accumulation of the contents of any of the blood-vessels or ducts.

Conjunctiva (cōn-jungc-tai'vą). The delicate mucous membrane lining the eyelids and covering the external portion of the eyeball.

Conjunctival (cōn-jungc-tai'vāl). Pertaining to the conjunctiva.

Conjunctivitis (cōn-jungc-t*i*-vai't*i*s). Inflammation of the conjunctiva.

Constriction (cōn-str*i*c'shōn). A contraction or stricture; that which constricts.

Contraindication (cōn''trą-*i*n-d*i*-cê'shōn). That which forbids the use of a remedy which otherwise it would be proper to exhibit. Any condition of disease which renders some special line of treatment or some particular remedy undesirable or improper.

Convalescence (c*o*n-vā-l*e*s'ēns). The state or period between the removal of actual disease and the full recovery of the strength.

Convalescent (c*o*n-vā-l*e*s'ēnt). Returning to full health after a disease is removed.

C. Diet, a diet for convalescing patients consisting of any light, simple, and appetizing food.

Convulsion (cōn-vul'shōn). Violent agitation of the limbs or body, generally marked by clonic spasms.

Cornea (cȏr'ni-ą). The transparent structure forming the anterior part of the eyeball.

Coronal (cor'o-nāl). Belonging to, or relating to, the crown of the head.

C. Suture, the suture formed by the union of the frontal bone with the two parietal bones. (See Fig. 27.)

Couveuse (cû-vĕz'). An arrangement or apparatus designed for the preservation and development of infants prematurely born or otherwise feeble. An *incubator* (Fig. 151), which term is in more common use in the United States.

Cranioclasis, Cranioclasm (crê-ni-o-clê'sis, crê'ni-o-clazm). The crushing of the fetal skull.

Cranioclast (crê'ni-o-clast). An instrument used in effecting cranioclasis. (Fig. 95.)

Craniotomy (crê-ni-ot'o-mi). The opening of the fetal skull when necessary to effect delivery.

C. Scissors, strong S-shaped scissors for use in craniotomy. (Fig. 100.)

Crotchet (crotsh'et). A curved instrument for extracting the fœtus after craniotomy. No longer used.

Curd (cŭrd). The coagulum which separates from milk upon the addition of acid, rennet, or wine. It consists of casein with most of the fatty elements of the milk.

Curettage (ciu-ret'ĕj). The act of using a curette.

Curette (ciu-ret'). [French.] 1. A sort of scraper or spoon used in removing granulations, foreign bodies, incrustations, etc., from the walls of normal or other cavities in the body. Most commonly used for removing diseased tissue or foreign matter such as retained placental tissue from the walls of the uterus. (Fig. 135.) 2. To use a curette.

Curettement (ciu-ret'mĕnt). Same as *Curettage.*

Cutaneous (ciu-tê'ni-us). Belonging to the skin.

Cutis (ciû'tis). The skin, consisting of the cutis vera and the epidermis. Also, the cutis vera, or true skin.

Cyanosis (sai-ā-nô'sis). A blue color of the skin resulting from congenital malformation of the heart from some defect of the pulmonary circulation by which the venous blood is not wholly oxygenated.

Cyanotic (sai-ā-not'ic). Relating to cyanosis; affected with cyanosis.

Decapitation (di-cap-i-tê'shōn). The removal of the head of the fœtus in embryotomy.

Decidua (di-sid'iu-ą). The membranous structure produced during gestation and thrown off from the uterus after parturition. It consists

of the greatly changed uterine mucous membrane and the fetal envelopes.

D. Reflexa, that portion of the decidua which is reflected over and surrounds the ovum.

D. Serotina, "late decidua," that portion of the decidua vera which becomes the maternal part of the placenta.

D. Vera, that portion of the decidua which lines the interior of the uterus. (Fig. 19.)

Decomposition (dî-com-po-zish'ŏn). 1. The separation of compound bodies into their constituent parts or principles; analysis. 2. Putrefactive decay.

Delirium (di-lir'i-um). A derangement of the functions of the brain characterized by incoherent and wandering talk, illusions, and unsteady gait.

Delivery (di-liv'ĕr-i). [French, *délivrer,* to free, to deliver.] 1. The expulsion of a child by the mother, or its extraction by the obstetric practitioner. 2. The removal of a part from the body; as *delivery* of the placenta.

Denudation (den-iu-dê'shōn). The laying bare of any part of an animal or plant; the stripping off of the integument, whether by a surgical or by a pathological process.

Denuded. Laid bare.

Diagnosis (dai-ag-nô'sis). The art or science of signs or symptoms by which one disease is distinguished from another.

Diagnostic (dai-ag-nos'tic). 1. Relating to diagnosis. 2. Distinctive; of sufficient value to enable one to make a diagnosis.

Diaphoresis (dai"ā-fo-rî'sis). A state of perspiration; profuse perspiration; sweat.

Diaphoretic (dai"ā-fo-ret'ic). 1. Causing perspiration. 2. A medicine having the power to produce diaphoresis.

Diathesis (dai-ath'e-sis). A particular habit or disposition of the body which renders it peculiarly liable to certain diseases; constitutional predisposition.

Diet (dai'et). The food proper for invalids. Also, the regulation of food to the requirements of health and the cure of disease.

D.-Sheet, a written or printed dietary.

Dietary (dai'e-tê-ri). A system or course of diet; a regulated allowance of food given to each person daily. See *Diet-Sheet.*

Dietetic (dai-e-tet'ic). Belonging to the taking of proper food, or to diet.

D. Treatment, treatment of disease by careful and scientific regulation of the diet.

Differential (dif-e-ren'shāl). Making a difference; showing a difference; distinguishing.

D. Diagnosis, the determining of the distinguishing features of a malady when nearly the same symptoms belong to two different classes of disease, as in gout and rheumatism or epilepsy and eclampsia.

Dilute, Diluted (dai-liût', dai-liû'ted). Mixed, weak; reduced in strength; rendered weaker by the addition of water.

Disintegration (dis-in-ti-grê'shŏn). The separation of the integrant parts or particles of a body.

Diuresis (dai-iu-rī'sis). Increased discharge of urine, from whatever cause.

Diuretic (dai-iu-ret'ic). 1. Belonging to diuresis; causing diuresis. 2. A medicine which increases the flow of urine.

Dropsy (drop'si). The accumulation of serous fluid in the tissues or in the thorax or abdomen.

Duct. A tube or canal by which a fluid is conveyed.

Ductus (duc'tus). A duct.

D. Arteriosus, "arterial duct," a blood-vessel peculiar to the fœtus, communicating directly between the pulmonary artery and the aorta. (See Figs. 28 and 29.)

D. Venosus, "venous duct," a blood-vessel peculiar to the fœtus, establishing a direct communication between the umbilical vein and the descending vena cava. (See Figs. 28 and 29.)

Dysmenorrhœa (dis-men-o-rī'ą). Difficult and painful menstruation.

Dyspnœa (dis-pnî'ą). Difficult or labored breathing.

Dystocia (dis-tŏ'si-ą). Difficult, slow, or painful birth or delivery. It is distinguished as *Maternal* or *Fetal* according as the difficulty is due to some deformity on the part of the mother or on that of the child.

Placental D., difficulty in delivering the placenta.

Eclampsia (ec-lamp'si-ą). Any epileptiform seizure, especially recurrent convulsions, not immediately due to disease of the brain.

Puerperal E., a convulsive attack coming on in women during or after labor and due probably to uræmia.

Ectopic (ec-top'ic). Out of place.

E. Gestation, gestation in which the fœtus is out of its normal place in the cavity of the uterus. (Fig. 34.) See *Extra-uterine Pregnancy.*

E. Pregnancy, same as *Ectopic Gestation.*

E. Sac, the amniotic sac in ectopic gestation.

Eczema (ec'ze-mā). A superficial affection of the skin characterized by a smarting eruption of small vesicles, generally crowded together, without fever, and not contagious.

Eczematous (ec-zem'ā-tus). Belonging to or affected with eczema.

ELIMINATE (i-lim'*i*-nêt). To put out or expel; to throw off or set free.

ELIMINATION (i-lim-*i*-nê'shōn). The act of expelling from the body as waste products.

ELIMINATIVE (i-lim'*i*-ne-tiv). 1. Tending to increase elimination or excretion. 2. Any agent or remedy that promotes excretion.

EMACIATION (i-mê-shi-ê'shōn). The state of being or becoming lean.

EMBOLISM (*e*m'bo-lizm). The obstruction of an artery or a vein by a clot of coagulated blood, or by any body brought from some point away from the site of obstruction. See *Embolus* and *Thrombus*.

AIR E., embolism in which the obstruction consists of air-bubbles.

EMBOLUS (*e*m'bo-lus). A piece of blood-clot which has been formed in the larger vessels in certain morbid conditions and has afterwards been forced into one of the smaller arteries so as to obstruct the circulation.

EMBRYO (*e*m'bri-ô). The product of conception in utero before the end of the third month of pregnancy; after that it is called the fœtus. (Fig. 24.)

EMBRYOTOMY (*e*m-bri-*o*t'o-m*i*). The destruction or separation of any part or parts of the fœtus in utero when circumstances exist to prevent delivery in the natural way.

EMETIC (i-m*e*t'*i*c). 1. Having the power to excite vomiting. 2. A medicine which causes vomiting.

EMMENAGOGUE (*e*-m*e*n'ā-gog). A medicine having the power to promote the menstrual discharge.

EMULSION (i-mUl'shōn). An oily or resinous substance suspended in water through the agency of mucilaginous or adhesive substances. Milk is a natural and perfect emulsion.

EMUNCTORY (i-mUngc'to-r*i*). 1. Excretory. 2. Any excretory duct of the body.

ENEMA (*e*n'e-mą). A medicine to be thrown into the rectum; a clyster; a rectal injection.

ENERVATION (*e*n-ĕr-vê'shōn). Weakness; languor; lack of nerve stimulus.

ENSIFORM (*e*n'si-fôrm). Like a sword; sword-shaped.

E. APPENDIX, CARTILAGE, or PROCESS, the extremity of the sternum or breast-bone.

EPIDEMIC (*e*p-*i*-d*e*m'*i*c). 1. A term applied to any disease which seems to be upon the entire population of a country at one time, as distinguished, on the one hand, from *sporadic* disease (or that which occurs in isolated cases) and, on the other, from *endemic* disease (or that which is limited to a particular district). 2. An epidemic disease; the season of prevalence of any epidemic disease.

EPILEPSY (*e*p'*i*-l*e*p-si). The falling sickness; a chronic non-febrile nervous affection, characterized by seizures of loss of consciousness, with tonic or clonic convulsions ("fits"). The ordinary duration of

a fit is from five to twenty minutes. The frequency of the attacks or fits varies immensely; in some cases they occur daily and in others at intervals of ten years or more.

Epileptic (*ep-i-lep'tic*). 1. Belonging to epilepsy. 2. A person affected with epilepsy.

Epileptiform (*ep-i-lep'ti-fôrm*). Like epilepsy.

Episiotomy (*ep''i-sai-ot'o-mi*). Surgical or obstetrical incision of the vulvar orifice.

Ergot (*ĕr'gōt*). A drug having the remarkable property of exciting powerfully the contractile force of the uterus, and chiefly used for this purpose, but its long-continued use is highly dangerous. Usually given in the fluid extract. Dose, ʒss–ii.

Ergotin (*ĕr'gō-tin*). The extract of ergot or active principle of ergot. Dose, $^1/_{15}$ to $^1/_2$ grain.

Ergotole (*ĕr'gō-tôl*). A proprietary preparation of ergot said to possess double the strength of the official fluid extract. Dose, ʒss–i.

Erosion (i-rô'zhōn). An eating or gnawing away: similar to ulceration.

Evacuation (i-*vac*-iu-ê'shōn). 1. The act of discharging the contents of the bowels, or defecation. 2. The discharge itself; a dejection or stool.

Evisceration (i-*vis*-*ē*-rê'shōn). Taking the bowels or viscera out of the body.

Obstetric E., removal of the abdominal or thoracic viscera of the fœtus in embryotomy.

Exacerbation (*eg-zas-ĕr*-bê'shōn). 1. An increased force or severity of the symptoms of a disease. 2. The stage or time of periodical aggravation in certain fevers.

Excoriation (*ecs*-co-ri-ê-shōn). Abrasion or removal, partial or complete, of the skin.

Excrement (*ecs*'cri-*mēnt*). Originally, anything that is excreted: usually applied to the alvine fæces.

Excrementitious (*ecs*''cri-*men-tish*'us). Belonging to excrement.

Excrete (*ecs*-crit'). To separate from the bodily tissues useless matter which is to be cast out of the system.

Excretion (*ecs*-crî'shōn). 1. The separation of those fluids from the blood which are supposed to be useless, as urine, perspiration, etc. 2. Any such fluid itself.

Exostosis (*ec-sos*-tô'*sis*). An exuberant growth of bony matter on the surface of a bone.

Expiration (*ecs*-p*i*-rê'shōn). The act of breathing out or expelling air from the lungs.

Expiratory (*ecs*-pair'e-to-*ri*). Relating to or of the nature of expiration.

Expire (*ecs*-pair'). 1. To expel the breath; to breathe out. 2. To die.

Expulsive (*ecs*-pul'*siv*). Tending towards, promoting, or causing expulsion.

E. Pains, labor-pains occurring during the expulsive stage and accomplishing the expulsion of the fœtus.

E. Stage, that stage of labor which follows complete dilatation of the uterine cervix, during which the expulsion of the fœtus takes place; the second stage of labor.

Exsanguination (*ec*-s*a*ng-gui-nē'shŏn). The state of being without blood.

Extension (*ec*s-t*e*n'shŏn). The reverse of flexion.

Extravasation (*ec*s-tr*a*v-ā-sē'shŏn). The escape of any fluid of the body, normal or abnormal, from the vessel, cavity, or canal that naturally contains it, and its diffusion into the surrounding tissues.

Extra-uterine (ec*s*-trą-iû'tē-r*i*n). Outside of the uterus.

E. Life, life after birth.

E. Pregnancy, pregnancy in which the fœtus is contained in some organ outside of the uterus. (Fig. 34.)

Fæces (fī'sîz). The alvine excretions or excrement. The matter expelled from the bowels at stool.

Fallopian (f*a*-lō'pi-ān). [Relating to G. *Fallopius,* a celebrated Italian anatomist of the sixteenth century.]

F. Tubes, the oviducts,—two canals extending from the side of the fundus uteri to the ovaries. (Fig. 11.)

F. Pregnancy, pregnancy occurring in the Fallopian tubes,—same as *tubal pregnancy.* (Fig. 34.)

Febrile (fī'br*i*l, or f*e*b'r*i*l). Belonging to fever; feverish.

Fecal (fī'cāl). Relating to fæces: containing fæces.

Fecundation (f*e*c-un-dē'shŏn). The act of impregnating or the state of being impregnated; the fertilization of the ovum by means of the male seminal element.

Fenestrated (f*e*n-*e*s-trē't*e*d). Pierced with openings.

Fetus (fī'tus). The same as *Fœtus.* The spelling *fetus* is preferable from a linguistic point of view; but the other is far more common in professional literature.

Fillet (f*i*l'*e*t). A noose for making traction on the fœtus in difficult labor. Never used now.

Finger Cot. A thin rubber covering for the finger to protect it from the air or from septic discharges. Occasionally used as a dressing to cover a slight wound or abrasion of the finger.

Fissure (f*i*sh'iur). A crack or narrow opening.

Flex (fl*e*x). To bend, as a joint or a jointed limb.

Flexion (fl*e*c'shŏn). The act of bending; the state of being bent.

F. Stage, that stage of labor in which the head of the fœtus bends forward.

Fœtus (fī'tus). The child in utero from the end of the third month of

pregnancy till birth. (See Fig. 25.) During the first three months the product of conception is known as the *embryo.*

FONTANEL, FONTANELLE (*fon*-tā-*nel'*). The quadrangular space between the frontal and two parietal bones in very young children. This is called the *anterior f.* and is the familiar "soft spot" just above a baby's forehead. A smaller, triangular one (*posterior f.*) sometimes exists between the occipital and parietal bones.

FORAMEN (fo-rē'*men*). A hole, opening, aperture, or orifice,—especially one through a bone.

F. OVALE, an opening situated in the partition which separates the right and left auricles of the heart in the fœtus.

FORCEPS (fôr'*seps*). An instrument consisting of two arms which can be approximated and used for grasping a part. (Figs. 76, 77, 78, and 79.)

FORMULA (fôr'miu-lą). 1. A short form of prescription in practice in place of the more full instruction in the Pharmacopœia. 2. A concise mode of indicating by symbols the chemical constituents of a compound or the result of chemical changes.

FORNIX (fôr'*nics*). Pl. *fornices.* An arch; any vaulted surface.

F. OF THE VAGINA, the angle of reflection of the vaginal mucous membrane onto the cervix uteri.

FOURCHETTE (fûr-*shet'*). [French, "fork."] The posterior angle or commissure of the labia majora.

FRIABLE. Easily reduced into small pieces.

FUNCTION (fungc'shōn). A power or faculty by the exercise of which the vital phenomena are produced; the special office of an organ in the animal or vegetable economy.

FUNDUS (fun'dus). The base or bottom of any organ which has an external opening considered as the top.

F. UTERI, the base of the uterus, which is to be considered as upside down with the top (os) pointing downward. (See Fig. 12.)

FUNIS (fiû'*nis*). A cord,—especially the umbilical cord.

GALACTAGOGUE (*ga*-lac'tā-*gog*). 1. Causing the flow of milk. 2. Any drug which causes the flow of milk to increase.

GASTRIC (*gas'tric*). Belonging to the stomach.

GENITAL (*jen'i*-tāl). 1. Belonging to generation. 2. Relating to the genital organs.

GENUPECTORAL (*jen*-iu-*pec'*to-rāl). [Latin, *ge'nu,* knee, + *pec'tus,* breast.] Relating to the knees and chest.

G. POSITION, that posture in which the patient rests on the knees with the thighs upright, the head and upper part of the chest being on the table or bed. The knee-chest position. (Fig. 107.)

Germicidal (jĕr′mi-sai-dāl). Destroying germs.

Germicide (jĕr′mi-said). A substance which has the power of destroying micro-organisms.

Gestation (jes-tê′shōn). The condition of a pregnant female; pregnancy; gravidity.

G. Sac, the sac enclosing the embryo in ectopic pregnancy.

Gland (gland). An organ consisting of blood-vessels, absorbents, and nerves, for secreting or separating some particular fluid from the blood.

Glandular (glan′diu-lạr). Pertaining to or like a gland in appearance, function, or structure; also, furnished with glands.

Glans (glanz). An acorn-shaped organ.

G. Clito′ridis, the bulbous extremity of the clitoris.

G. Pe′nis, the nut-like head or end of the penis.

Graafian Follicles or Vesicles (grâf′i-ān). Small spherical bodies in the ovaries, each containing an ovum. (Fig. 15.)

Granulation (gran-iu-lê′shōn). The process by which little grain-like, conical fleshy bodies form on ulcers and suppurating wounds, filling up the cavities, and bringing nearer together and uniting their edges. 2. One of the bodies thus formed.

Gravid Uterus (grav′id). The uterus in the impregnated state or during gestation.

Gravidity (gre-*vid*′ī-*ti*). The condition of a woman who is pregnant; gestation; pregnancy.

Gynæcic, Gynecic (*ji*-nī′*sic*). Relating to the female sex or to women.

Gynæcologist, Gynecologist (*jin*-i-*col*′o-*jist*). One who is skilled in gynæcology.

Gynæcology, Gynecology (*jin*-i-*col*′o-*ji*). A treatise on woman and the peculiarities of her constitution as compared with man; the science which treats of the female constitution and particularly of the diseases and injuries of the female genital organs.

Hæmorrhage, Hemorrhage (*hem*′ō-rêj). Escape of the blood from its natural channels; bleeding.

Hæmorrhoid, Hemorrhoid (*hem*′ō-roid). A pile; a vascular tumor immediately within (*internal h.*) or just outside of (*external h.*) the anus. Hemorrhoids are termed *blind* when they do not cause hemorrhage and *bleeding* when they do.

Hernia (hĕr′-ni-ą). the displacement, through an abnormal opening, of an organ or tissue, most commonly of a portion of the intestine from the cavity in which it is naturally contained; a "rupture."

Hydrometer (hai-dr*om*′*e*-tĕr). An instrument for ascertaining the specific gravity of fluids.

Hygiene (hai′ji-în). That department of medicine which has for its direct object the preservation of health or the prevention of disease.

Hygienic (hai-ji-*en'ic*). Belonging to hygiene.

Hypersecretion (hai"pĕr-si-crī'shŏn). Excessive secretion.

Hypertrophy (hai-pĕr'tro-*fi*). Enlargement of a part or an organ, especially when due to over-nutrition.

Hypodermatic, Hypodermic (hai"po-dĕr-*mat'ic*, hai-po-dĕr'*mic*). 1. Connected with the application of medicine under the skin; subcutaneous. 2. A medicine introduced under the skin.

H. Injection, an injection beneath the skin of drugs or nutrient solutions.

H. Needle, the hollow needle forming the nozzle of a hypodermic syringe.

H. Syringe, a small syringe with a fine-pointed nozzle for injecting fluids under the skin.

Hypogastric Arteries. Same as the umbilical arteries which accompany and form part of the umbilical cord.

Hysteria (*his*-tī'ri-ą). A functional disease often observed in young unmarried women, in which there may be a simulation of almost any disease and a great lack of self-control.

Iliac (*il'i-ac*). Belonging to the ilium or the flanks.

I. Artery, either of two arteries, right and left, given off from the abdominal aorta and dividing to form the external and internal iliac arteries on each side of the body.

I. Fossa, a broad and shallow cavity at the upper part of the inner surface of the ilium.

Ilium (*il'i-um*). Pl. *il'ia*. The haunch bone; the broad, flat, upper portion of the innominate bone. (Fig. 1.)

Impregnation (*im-preg-nê'shŏn*). The act of making, or state of being pregnant; fecundation.

Incise (*in-saiz'*). To cut, as with a knife.

Incised Wound (*in-saizd'* wûnd). A wound made by a sharp cutting instrument.

Incision (*in-sizh'ōn*). A wound made by cutting,—especially an operation-wound.

Incubator (*in'ciu-bê-tọr*). See *Couveuse*.

Indurate, Indurated (*in'diu-rêt*, -rê-*ted*). Made hard; hardened.

Induration (*in-diu-rê'shŏn*). The state or process of hardening of the tissues from any cause; the hardening of any part from the effect of disease; any part or tract of abnormally hardened tissue.

Infection (*in-fec'shŏn*). 1. The communication of a disease by personal contact with the sick or by means of effluvia arising from the body of the sick; contagion. 2. The agent by which a communicable disease is conveyed; a contagium.

Septic I., infection caused by septic germs. See *Septic*.

Infectious (*in*-fec'shus). Capable of extension by infection; contagious; easily communicated.

Inflammation (*in*-flā-mê'shōn). A state of disease characterized by redness, pain, heat, and swelling, attended or not with fever.

Infusion (*in*-fiû'zhōn). To pour in or upon. In surgery the injection of hot normal salt solution ($^{6}/_{10}$ per cent.) into a blood-vessel.

Venous I., when the injection is made into a vein.

Arterial I., when the injection is made into an artery.

Subcutaneous I., when the injection is made into the subcutaneous connective tissue, usually under the breast, over the shoulder-blade, or in the outer side of the thigh. (Fig. 111.)

Ingest (*in*-*je*st'). To throw in, or put in, as food into the stomach.

Ingesta (*in*-*je*s'tą). Food taken into the body by the mouth.

Ingestion (*in*-*je*s'tshōn). The act of putting or taking food into the stomach.

Inhalation (*in*-he-lê'shōn). A drawing of the air into the lungs; the inspiring of medicated or poisonous fumes with the breath.

Insomnia (*in*-so*m*'ni-ą). Want of sleep; wakefulness; chronic or habitual privation of sleep.

Innominate (*i*-no*m*'*i*-nêt). Having no name; unnamed.

I. Bone, the hip-bone, composed of the ilium, ischium, and os pubis. (Fig. 1.)

Innominatum (*i*-no*m*-*i*-nê'tum). The innominate bone. (Fig. 1.)

Inspiration (*in*-sp*i*-rē'shōn). The act of drawing in the breath.

Inspiratory (*in*-spai're-to-r*i*). A term applied to muscles which by their contractions increase the dimensions of the chest and thus produce inspiration.

Intertrigo (*in*-tĕr-trai'gō). An excoriation or galling of the skin about the anus, axilla, or other part of the body, with inflammation and moisture.

Intestine (*in*-te*s*'t*i*n). The long membranous tube, continuing from the stomach to the anus, in the cavity of the abdomen; the bowels or entrails.

Inunction (*in*-ungc'shōn). The act of rubbing in an ointment, or simply of anointing. This is a method of applying certain substances to the cutaneous surface, the object being to promote their absorption.

In utero. Inside the uterus.

Inversion (*in*-vĕr'shōn). A turning upside down, inside out, or end for end.

I. of the Uterus, the state of the womb being turned inside out, caused by violently drawing away the placenta before it is detached by the natural process of labor. (Fig. 105.)

Involution (*in*-vo-liû'shŏn). 1. A rolling or pushing inward. 2. A retrograde process of change the reverse of evolution: particularly applied to the return of the uterus to its normal size and condition after parturition.

Irrigation (*ir*-*i*-gê'shŏn). 1. The continual application of water or of a lotion on an affected part; the washing out of a cavity by a stream of water. 2. The liquid used in washing out a cavity or a wound.

Ischium (*is*'ci-um). The posterior and inferior bone of the pelvis, distinct and separate in the fœtus or the infant; or the corresponding part of the innominate bone in the adult. (Fig. 1.)

Jaundice (jân'*dis*, or jôn*dis*). Yellowness of the skin, eyes, tissues, and secretions generally from impregnation with bile-pigment; icterus.

Knee-chest Position. See *Genupectoral Position.*

Labia (lê'bi-ą). The nominative plural of *labium.* Lips or lip-like structures.

L. Majora, the folds of skin containing fat and covered with hair which form each side of the vulva.

L. Minora, the nymphæ, or folds of delicate skin inside of the labia majora. (Fig. 8.)

Labor (lê'bŏr). Parturition; the process by which a fœtus is separated and expelled from its mother.

Dry L., when there is a lack of amniotic fluid.

Induced L., when brought on by outside interference.

Missed L., when the normal processes cease and the fœtus is retained.

Precipitate L., when of abnormally short duration.

Premature L., when occurring before the normal time.

Spontaneous L., when without any assistance.

Laceration (l*as*-ē-rê'shŏn). The act of tearing; a rent or torn place in any tissue; a wound made by tearing.

Lactation (l*ac*-tê'shŏn). The act or period of giving suck; the secretion of milk; the time or period of secreting milk.

Lacteal (l*ac*'ti-āl). Resembling or relating to milk.

L. Calculus, a concretion of thickened milk occurring in the breast.

L. Swelling, swelling of the breast from accumulation of milk due to obstruction of the lacteal ducts.

Lactiferous (l*ac*-tif'ē-rus). Practically the same as *lacteal.*

Lactometer (lac-tom'e-tĕr). An hydrometer for determining the specific gravity of milk.

Lambdoid, Lambdoidal (lam'doid, lam-doi'dāl). Having the shape of the Greek letter Λ

L. Suture, the suture between the occipital and two parietal bones. (See Fig. 27.)

Laparotomy (lap-ā-rot'o-mi). Cutting into the abdominal cavity through the flank; less correctly, abdominal section at any point.

Larynx (lar'ingcs). That portion of the air-passages between the base of the tongue and the windpipe.

Laxative (lac'sā-tiv). 1. Slightly purgative or aperient; mildly cathartic. 2. A laxative medicine.

Lesion (lī'zhun). A hurt, wound, or injury of a part; a pathological alteration of a tissue.

Lethargic (le-thâr'jic). Belonging to lethargy; in a state of lethargy.

Lethargy (leth'ąr-ji). A state of marked drowsiness, stupor, or sleep which cannot easily be driven off.

Leucorrhœa (liu-co-rī'ą). A whitish discharge from the female genital organs; the whites.

Ligature (lig'ā-tshur). A thread or cord used for tying around an artery, vein, or any growth.

Linea (lin'i-ą). Pl. *lineæ*. A line or thread.

L. Alba, the central tendinous line extending from the pubic bone to the ensiform cartilage.

Lineæ Albicantes, shining whitish lines upon the abdomen caused by pregnancy or distention; striæ gravidarum. (Fig. 30.)

Liquor (lic'or, or lai'cwôr). A liquid.

L. Amnii, the fluid contained within the amnion in which the fœtus floats.

Lithotomy Position (li-thot'o-mi). The position of a patient flat on the back with legs and thighs flexed and thighs separated widely; also called the *dorso-sacral* posture. (Fig. 126.)

Lochia (lô'ci-ą). The discharge from the genital canal during several days subsequent to delivery.

Lochial (lô'ci-āl). Relating to the lochia.

Lying-in (lai''ing-in'). The puerperal state.

L. Fever, puerperal fever.

L. Hospital, a hospital where pregnant women are cared for before, during, and after labor.

Malaise (mal-êz'). [French, *mal,* ill, + *aise,* ease.] Discomfort or uneasiness; indisposition.

Malposition (mal-po-zish'ōn). An abnormal position, as of the fœtus; a displacement. (See Fig. 50.)

MALPRACTICE (mal-prac'tis). Practice contrary to good judgment, whether from ignorance, carelessness, or a wrong motive.

MAMMA (mam'ą). Pl. *mammæ*. ["Ma-ma," the instinctive cry of an infant.] The breast of the human female. (Fig. 14.)

MAMMARY (mam'ā-ri). Belonging to the mamma, or female breast.

MANIA (mê'ni-ą). A form of insanity marked by an exalted but perverted mental activity.

MANIACAL (me-nai'ā-cāl). Affected with mania; resembling mania.

MANUAL (man'iu-āl). Relating to, or performed by, the hands.

MASSAGE (ma-sâzh'). The systematic therapeutical use of rubbing, kneading, stroking, slapping, straining, pressure, and other passive exercises applied to the muscles and accessible parts.

MATERNAL (me-tĕr'nāl). Relating to or originating with the mother.

MATERNITY (me-tĕr'nī-ti). 1. Motherhood; the condition of being a mother. 2. A lying-in hospital.

M. NURSE, an obstetric nurse.

MEATUS (mi-ê'tus). A passage; an opening leading to a canal, duct, or cavity.

M. URINARIUS, the external orifice of the urethra. (Fig. 8.)

MECONIUM (mi-cō'ni-um). The dark-green or black substance found in the large intestine of the fœtus or newly born infant.

MEDIAN (mî'di-ān). In the middle; between others; medial or mesial.

MELANCHOLIA (mel-ān-cō'li-ą). A form of insanity (and a condition of mind bordering upon insanity) in which there is great depression of spirits, with gloomy forebodings.

MELANCHOLIC (mel-ān-col'ic). Belonging to melancholia.

MEMBRANE (mem'brên). A skin-like tissue used to cover some part of the body, and sometimes forming a secreting surface. *Mucous membranes* line cavities and canals which communicate with the external air, as the nose, mouth, etc. *Serous membranes* line cavities which have no external communication, such as the pleural and peritoneal cavities. They have a smooth, glossy surface from which exudes a transparent serous fluid that gives to them their name. When this fluid is secreted in excess dropsy of those parts is the result. The word "MEMBRANES" is also used to indicate the amniotic sac which surrounds the fœtus.

MENSES (men'sîz). [Pl. of Latin *mensis*, month.] The periodical monthly discharge of blood from the uterus; the catamenia.

MENSTRUAL (men'stru-āl). Relating to, or caused by, the menses.

MENSTRUATE (men'stru-êt). To have the catamenial flow; to have the "monthly flow."

MENSTRUATION (men-stru-ê'shōn). The monthly period of the discharge of a red fluid from the uterus; the function of menstruating. It occurs from puberty to the menopause.

Menopause (*men'*o-pôz). The period at which menstruation ceases; the "change of life."

Microscopic (mai-cro-sc*op'ic*). So minute that it can be seen only by means of a microscope.

Midwife (m*id'*waif). A woman who delivers women with child; a female obstetrician.

Miscarriage (m*is-car'*êj). The expulsion of the fœtus at any time between the third and sixth month of gestation. More generally used to indicate the expulsion of the fœtus at any time up to the period of viability of the child.

Mons Veneris (m*on*z ve'neris). The eminence in the upper and anterior part of the pubes of women. (Fig. 8.)

Monster (m*on'*stĕr). A fœtus born with a redundancy or deficiency, a confusion or transposition, of parts. For example, a child born with two heads or with but one eye.

Monstrosity (m*on*-str*os'*ī-t*i*). A monster.

Monthlies (mUnth'liz). The menses.

Morbid (môr'b*id*). Diseased or pertaining to disease. Morbid is used as a technical or scientific term in contradistinction to the term healthy.

Morbidity, Morbility (môr-b*id'*ī-t*i*, môr-b*il'*ī-t*i*). 1. The condition of being diseased. 2. The amount of disease or illness existing in a given community; the sick-rate.

Mother's Mark. A nævus; a birthmark.

Mucosa (miu-cô'są). A mucous membrane.

Mucous, Mucose (miû'cus, miû'côs). Belonging to or resembling mucus; covered with a slimy secretion or with a coat that is soluble in water and becomes slimy.

M. Membrane. See *Membrane.*

Mucus (miû'cus). The viscid liquid secretion of a mucous membrane.

Multigravida (mUl-t*i*-gr*av'i*-dą). A woman who has been pregnant several times, or many times.

Multipara (mUl-t*ip'ā*-rą). A woman who has borne several, or many, children.

Mummification (mUm''*i*-f*i*-cê'shōn). The shrivelling up and compression of a dead fœtus.

Nævus (nî'vu*s*). A natural mark or blemish; a mole, a circumscribed deposit of pigmentary matter in the skin.

Nates (nê'tîz). The buttocks.

Nausea (n*ô'*shą). Originally, sea-sickness. Any sickness at the stomach similar to sea-sickness.

Navel (nê'v*ēl*). The umbilicus.

N. String, the umbilical cord.

Nephritis (ne-frai'tis). Inflammation of the kidney.

Neurotic (niu-rot'ic). Of or belonging to the nerves; nervous.

Neutral (niû'trāl). Neither one nor the other; indifferent.

N. Reaction, a reaction which is neither acid nor alkaline.

Nitrogenous (nai-troj'e-nus). Containing nitrogen; nitrogenized.

Nodular (nod'iu-lạr). Belonging to a nodule; having the form of a nodule.

Nodule (nod'iul). A little node; a small rounded mass.

Normal (nôr'māl). Regular; without any deviation from the ordinary structure or function; according to rule.

Nutrient (niû'tri-ēnt). 1. Nutritious; nourishing. 2. A nutritious substance.

N. Enema, an injection of nutrient fluid into the rectum for the purpose of maintaining the strength of the system when, for any reason, food cannot be taken into the stomach.

Nutriment (niû'tri-mēnt). Nourishment.

Nutrition (niu-trish'ōn). The assimilation or identification of nutritive matter to or with our organs.

Nutritious (niu-trish'us). Nourishing; affording nourishment or nutrition.

Nutritive (niû'tri-tiv). Pertaining to nutrition; capable of repairing the waste of the body; nutritious.

N. Enema, same as *Nutrient Enema.*

Obstetric, Obstetrical (ob-stet'ric, ob-stet'ri-cạl). Belonging to midwifery or obstetrics.

Obstetrician (ob-ste-trish'ān). An accoucheur, or man-midwife; a practitioner of obstetrics; one who is skilled in obstetrics.

Obstetrics (ob-stet'rics). [Latin, *obstetrix,* midwife.] The art of assisting women in child-birth and of treating their diseases during pregnancy and after delivery; midwifery.

Occiput (oc'si-put). The back part of the head.

Œdema (i-di'mạ). A swelling from effusion of serous fluid into the cellular substance; a dropsical swelling.

Oligohydramnios (ol''i-go-hai-dram'ni-os). Deficiency of the amniotic fluid.

Opacity (o-pas'ī-ti). 1. Incapability of transmitting light; the reverse of transparency. 2. Any defect in the transparency of the cornea, from a slight film to an intense whiteness.

Organ (ôr'gān). A part of an animal or vegetable capable of performing some act or office appropriate to itself, as, for example, the heart, the lungs, or the stomach.

Os. Mouth.

O. Externum (*external os*), the external opening of the canal of the cervix.

O. Internum (*internal os*), the internal opening of the canal of the cervix.

O. Uteri, "mouth of the uterus." (See Fig. 12.)

Os. [Pl. *ossa.*] A bone.

O. Innominatum, the innominate bone. (Fig. 1.)

Osmosis (*os*-mō'*sis*). The power or action by which liquids are impelled through a moist membrane and other porous partitions.

Osteomalacia (*os*''ti-o-m*a*-lē'si-ą). A disease marked by progressive softening of the bones from loss of their earthy constituents, so that they become flexible and fragile and unable to support the body. The disease affects adults, especially pregnant women, and is frequently fatal.

Ova. Plural of ovum.

Ovarian (o-vē'ri-ān). Belonging to the ovary.

Ovary (ō'v*ā*-r*i*). The sexual gland of the female in which the ova are developed. (Fig. 13.) There are two ovaries, one at each side of the pelvis.

Oviduct (ō'v*i*-duct). The Fallopian tube which conveys the ovum from the ovary to the uterus. (See Fig. 13.)

Ovisac (ō'v*i*-s*a*c). Same as *Graafian Follicle.*

Ovulation (*o*v-iu-lē'shōn). The growth and discharge of an unimpregnated ovum, usually coincident with the menstrual period.

Ovule (*o*v'iul). A "little egg." The ovum before its discharge from the Graafian follicle.

Ovum (ō'vum). 1. An egg, particularly a hen's egg. 2. The female reproductive cell. The human ovum is a round cell about $^1/_{120}$ of an inch in diameter, developed in the ovary. (Fig. 23.)

Oxytocic (*o*c-s*i*-tō's*i*c). 1. Accelerating parturition. 2. A medicine which accelerates parturition.

Pack the Uterus. To tampon the uterus. See *Tampon.*

Pallor (p*a*l'o̤r). Paleness; loss of color.

Palpation (p*a*l-pē'shōn). [Latin, *palpa're,* to handle gently, to feel.] Examination by the hand or by touch; manipulation of a part with the fingers for the purpose of determining the condition of the underlying organs.

Obstetric P., palpation of the abdomen of the pregnant woman to determine the size, position, and presentation of the fœtus.

Palpitation (p*a*l-p*i*-tē'shōn). Convulsive motion of a part: applied especially to the rapid action of the heart, whether caused by disease or by excitement.

Papilla (p*a*-p*i*l'ą) [Pl. *papil'læ.*] Originally, a "pimple." Any minute, nipple-like eminence.

Parietal (pe-rai′*e*-tāl). Belonging to the parietes or walls of any cavity, organ, etc.

P. Bones, the two quadrangular bones that form the transverse arch of the cranium.

Paroxysm (p*ar*′*o*c-s*i*zm). An evident increase of symptoms which after a certain time decline; a periodical fit or attack; the periodic fits or attacks which characterize certain diseases.

Paroxysmal (p*ar*-ōc-s*iz*′māl). Relating to, or characterized by, paroxysms; occurring in paroxysms.

Parturient (pâr-tiû′ri-ēnt). Bringing forth; child-bearing.

P. Canal, the canal through which the fœtus passes in childbirth: it consists of the uterus and vagina regarded as one canal.

P. Woman, a woman about to give birth to a child.

Parturition (pâr-tiû-r*i*sh′ōn). Expulsion of the fœtus from the uterus; also the state of being in child-bed; labor.

Paternal (pe-tĕr′nāl). Relating to or originating with the father.

Pathologic, Pathological (p*a*th-o-l*o*g′*ic*, -l*o*g′*i*-cāl). Belonging to pathology; morbid.

Pathology (p*a*-th*o*l′o-j*i*). The doctrine or consideration of diseases; that branch of medical science which treats of diseases, their nature and effects.

Pelvimeter (p*e*l-v*i*m′*e*-tĕr). An instrument for measuring the diameters and capacity of the pelvis. (Fig. 5.)

Pelvimetry (p*e*l-v*i*m′*e*-tr*i*). The obstetrical measurement of the pelvis. It may be performed with the hand (*Digital p.*) or with a pelvimeter (*Instrumental p.*). When the measurements are made on the outside of the body it is *External p.;* when within the vagina, *Internal p.;* and when both within the vagina and outside of the body, *Combined p.* (See Figs. 6 and 7.)

Pelvis (p*e*l′v*i*s). [Latin, "basin."] The bony cavity forming the lowest part of the trunk. It is bounded behind by the sacrum and coccyx; at the sides and in front by the ossa innominata. (Fig. 1.)

Penis (pî′n*i*s). The male organ of copulation.

Perforator (pĕr′fo-rê-to͟r). An instrument for boring into the cranium. (Fig. 94.)

Perineorrhaphy (p*er*″*i*-ni-*or*′*ā*-*fi*). Suture of the perineum; the operation for the repair of lacerations of the perineum.

Perineum (p*er*-*i*-ni′um). The space between the genital organs and the anus. (See Fig. 9.)

Periphery (p*e*-r*if*′*ē*-r*i*). The circumference of a circle; the parts most remote from the centre.

Peristalsis (p*er*-*i*-st*al*′s*is*). The peculiar movement of the intestines and other tubular organs, like that of a worm in its progress, by

which they gradually propel their contents. Peristalsis is produced by the combined action of circular and longitudinal muscular fibres.

Peristaltic (*per-i-stal'tic*). Relating to peristalsis.

Peritoneal (*per''i-to-nî'ăl*). Relating to the peritoneum.

Peritoneum (*per''i-to-nî'um*). A strong serous membrane investing the inner surface of the abdominal walls and the viscera of the abdomen.

Peritonitis (*per''i-to-nai'tis*). Inflammation of the peritoneum; popularly, "inflammation of the bowels."

Pernicious (*pĕr-nish'us*). Baleful; deleterious; highly dangerous: as pernicious anæmia, or pernicious vomiting.

Perspiration (*pĕr-spi-rê'shŏn*). [Latin, *perspira're,* to breathe everywhere.] 1. Sweat. 2. The process or function of sweating.

Pessary (*pes'ā-ri*). An instrument, usually in the form of a ring or a ball, for introduction into the vagina, to prevent or remedy the prolapse of the uterus.

Phantom (*fan'tōm*). The small effigy of a child used to illustrate the progress of labor.

P. Pregnancy, feigned, hysterical, spurious, or false pregnancy; pseudocyesis.

P. Tumor, a tumor of the abdomen due to flatus or contraction of the abdominal muscles.

Pharmacopœia (*fâr''mā-co-pi'ą*). An authoritative book containing a description of the medicines and drugs in use in a country. The United States Pharmacopœia is published by authority once in ten years, after it has been revised by a national convention of physicians and pharmacists.

Phenomenon (*fi-nom'e-non*). Pl. *phenomena.* An appearance; anything remarkable. In pathology it is synonymous with symptom.

Phlegmatic (*fleg-mat'ic*). Dull; sluggish; cold; morose; not easily excited. The opposite of *nervous* when applied to one's disposition.

Physical (*fiz'i-cāl*). Belonging to nature.

Physiological (*fiz''i-o-loj'i-cāl*). Belonging to physiology.

Physiology (*fiz-i-ol'o-ji*). The doctrine of vital phenomena, or the science of the functions of living bodies.

Physique (*fi-zîc'*). Natural constitution; corporeal form; personal endowments; the physical or exterior parts of a person.

Pigment (*pig'mĕnt*). 1. Any dye or paint. 2. The normal coloring-matter of the organs and fluids of the body.

Pigmentary (*pig'men-te-ri*). Relating to pigment.

Pigmentation (*pig-men-tê'shŏn*). The formation or deposition of pigment.

Pipette (*pi-pet'*). A tube used in withdrawing or adding small quantities of fluid; used chiefly in chemical and pharmaceutical work.

Placenta (ple-*s*en'tą). The circular, flat, vascular structure in the impregnated uterus forming the principal medium of communication between the mother and the child. (Figs. 21 and 22.)

P. Prævia, that condition in which the placenta is situated internally over the mouth of the womb, often proving a cause of excessive hemorrhage (Fig. 35.)

Pledget. A little plug. A wad of lint, cotton, or the like, applied as to a wound or a sore to keep out the air, absorb discharges, or retain a dressing.

Plethora (pl*e*th'o-rą). A condition characterized by fulness of the blood-vessels, strong heart action and pulse, florid complexion, and general plumpness of the body.

Plethoric (pli-thŏ'r*i*c, or pl*e*th'o-r*i*c). Relating to plethora; full of blood.

Pleura (plû'rą). A serous membrane, divided into two portions and lining the right and left cavities of the chest or thorax.

Pleural (plû'rāl). Relating to the pleura.

Podalic (po-d*a*l'*i*c). By means of or relating to the feet.

P. Version, version by which the feet of the child are made to present. (See Fig. 71.)

Pole (pôl). The extremity of the axis of a sphere.

Polyhydramnios (pol''i-hai-dr*a*m'ni-*o*s). Hydramnion; excess in the amount of the amniotic fluid.

Posterior (p*o*s-tî'ri-o̤r). Situated dorsally or to the rear.

Postnatal (pôst-nê'tāl). Occurring after birth.

Post-partum (pôst-pâr'tum). After or subsequent to child-birth.

P. Chill, a chill, lasting several minutes, often following expulsion of the child.

P. Hemorrhage, hemorrhage following delivery.

P. Shock, the exhaustion immediately following labor.

Postpuerperal (pôst-piu-ĕr'p*e*-rāl). Occurring after child-birth.

Pregnancy (pr*e*g'nān-s*i*). [Latin, *præg'nans,* literally "previous to bringing forth."] The state of being with young or with child. The normal duration of pregnancy in the human female is two hundred and eighty days, or ten lunar months, or nine calendar months.

Pregnant (pr*e*g'nānt). With young or with child.

Premature (prî-me-tiûr'). Before it is ripe.

P. Infant, an infant born after the period of viability but before the last two weeks of normal pregnancy. (Fig. 154.)

P. Labor, labor which takes place during the last three months of the natural term, but before its completion.

P. Respiration, respiration on the part of a child before it is completely born.

Premonitory (pri-mon'*i*-to-r*i*). Advising beforehand; giving previous warning; precursory; applied to symptoms which give an indication or warning of the advent or onset of certain diseases,—for instance, chills, during the invasion of fever.

P. Pains, painless uterine contractions before the beginning of true labor.

Prepuce (prî'piûs). The fold of skin which covers the glans penis in the male.

P. of the Clitoris, the fold of mucous membrane which covers the glans clitoridis.

Primigravida (prai-m*i*-grav'*i*-dą). Pl. *primigravidæ*. A woman who is pregnant for the first time.

Primipara (prai-m*i*p'*ā*-rą). Pl. *primiparæ*. A woman who has brought forth her first child.

Prognosis (pr*o*g-nô's*i*s). The foreknowledge of the course of a disease drawn from a consideration of its signs and symptoms; the art of forecasting the progress and termination of any given case of disease.

Prognostic Symptom (pr*o*g-nos't*i*c). A symptom from a consideration of which a prognosis of any particular disease is formed.

Prognosticate (pr*o*g-nos't*i*-cêt). To make a prognosis.

Prolapse (pro-l*a*ps'). A falling down, partial or complete, of some viscus, in its latest stage accompanied by protrusion so as to be partly external or uncovered.

P. of the Cord, descent of the umbilical cord on the bursting of the bag of waters. (Fig. 106.)

P. of the Uterus, descent of the uterus, "falling of the womb."

Promontory (pr*o*m'*ō*n-to-r*i*). A small projection; a prominence.

P. of the Sacrum, the superior or projecting portion of the sacrum when in situ in the pelvis, at the junction of the sacrum and the last lumbar vertebra.

Prophylactic (pr*o*f-*i*-lac't*i*c). Belonging to prophylaxis; preventive.

Prophylaxis (pr*o*f-*i*-lac'sis). The art of guarding against disease; the observation of the rules necessary to the preservation of health or the prevention of disease.

Proteid (prô'ti-*i*d). Any one of a class of organic compounds forming the important part of animal and vegetable tissue. The proteid in milk is the part that forms the curd.

Pruritus (pru-rai'tus). An intense degree of itching.

Psychic, Psychical (sai'c*i*c, sai'c*i*-cāl). Belonging to the mind or intellect.

Ptyalism (tai'*ā*-l*i*zm). Increased and involuntary flow of saliva.

Puberty (piû'bĕr-t*i*). The age at which the generative organs become functionally active.

Pubic (piû'b*i*c). Belonging to the pubis.

Pubis (piû'bis). The os pubis or pubic bone forming the front of the pelvis. (Fig. 1.) sometimes, but incorrectly, written *pubes.*

Pudenda (piu-den'dą). Plural of *pudendum.*

Pudendal (piu-den'dāl). Relating to the pudendum.

Pudendum (piu-den'dum). [Latin, *pude're,* to have shame or modesty.] The external genital organs or parts of generation of either sex, but especially of the female: also used, perhaps more correctly, in the plural (pudenda). (See Fig. 8.)

Puerpera (piu-ĕr'pē-rą). A woman in child-bed, or one who has lately been delivered.

Puerperal (piu-ĕr'pē-rāl). Belonging to, or consequent on, child-bearing.

P. Convulsions, epileptiform convulsions occurring immediately before or after child-birth.

P. Eclampsia, same as puerperal convulsions. See *Eclampsia.*

P. Fever, a severe febrile disease which sometimes occurs in the puerperal state, usually about the third day after child-birth, accompanied by an inflamed condition of the peritoneum, due to septic infection.

P. Insanity or Mania, insanity occurring in females towards the end of pregnancy or soon after delivery.

P. State, the condition of a woman in, and immediately after, child-birth.

Puerperium (piû-ĕr-pi'ri-um). The state or period of a woman in confinement.

Pulmonary (pul'mo-ne-ri). Of the lungs or belonging to the lungs.

Pulsation (pul-sē'shōn). Any throbbing sensation resembling the beating of the pulse; the heart's action extending to the arteries, felt in any part of the body.

Purpura (pŭr'piu-rą). A disease in which there are small distinct purple specks and patches on the surface of the body, with general debility but not always fever.

Purpuric (pŭr-piû'ric). Relating to purpura.

Purulent (piû'ru-lēnt). Consisting of pus; of the nature of pus.

Pus (pus). A bland, cream-like fluid found in abscesses or on the surface of sores; matter; "corruption."

Rational (rash'ōn-āl). Conformable to reason or to a well-reasoned plan; reasonable. Also applied to the mental state of a person.

R. Symptoms, symptoms communicated by the patient to the physician; subjective symptoms.

Reaction (ri-ac'shōn). 1. Increase of the vital functions succeeding their depression. 2. The phenomena resulting from the action of two or more substances upon each other.

Rectal (*rec'tāl*). Connected with or pertaining to the rectum.

R. Alimentation, the administration of nourishment by means of enemata containing nutritive matter.

Rectum (*rec'tum*). The last portion of the large intestine, terminating at the anus; the lower bowel.

Reflex (*rī'flecs*). Reflected; caused by the conveyance of an impression to the central nervous system and its transmission through a motor nerve to the periphery.

Regurgitation (*ri-gĕr-ji-tē'shōn*). A flowing back; a flowing the wrong way: applied, for example, to the passive vomiting of infants and to the rising of food in the mouth of adults.

Relaxation (*rī-lac-sē'shōn*). The reverse of contraction or tension; looseness; want of muscular tone or vigor.

Remission (*ri-mish'ōn*). An abatement or diminution of symptoms.

Renal (*rī'nāl*). Belonging to the kidney.

Respiration (*res-pi-rē'shōn*). The function of breathing, including both inspiration and expiration.

Restitution (*res-ti-tiū'shōn*). The act of restoring or returning something,—particularly, rotation of the fetal head after its expulsion from the vagina, so that it looks in the same direction as it did before it entered the pelvic brim; external rotation of the fetal head. (Fig. 44.)

Resuscitation (*ri-sus-i-tē'shōn*). The act of restoring to life those who are apparently dead.

Retained Placenta (*ri-tênd'*). A placenta not expelled by the uterus after labor.

Retention (*ri-ten'shōn*). The keeping back or stoppage of any of the secretions, particularly the urine.

R. of Urine, a condition in which the urine is retained in the bladder and cannot be discharged voluntarily.

Rhachitic (*re-cit'ic*). Relating to or affected with rhachitis or rickets.

R. Pelvis, a pelvis deformed by rickets.

Rhachitis (*re-cai'tis*). Rickets.

Rickets (*ric'ets*). A disease of childhood in which there is a lack of the earthy salts in the bones, with resultant curvatures and deformities of them, affections of the liver and spleen, and a condition of general weakness. Nourishing food, fresh air, exercise, and tonics furnish the best mode of treatment.

Rotation (*ro-tē'shōn*). The act of turning round; the motion of any solid body about an axis.

R. Stage of Labor, that stage of labor at which the presenting portion of the fœtus rotates or turns round.

Rupture (*rup'tshur*). 1. Bursting or breaking of a part. 2. Hernia.

Sacrum (sê'crum). The triangular bone wedged between the ossa innominata, forming the posterior wall of the pelvis, articulating above with the vertebral column and below with the coccyx, and formed by the fusion of the five sacral vertebræ or segments. (Fig. 1.)

Sagittal (s*aj*'i-tāl). Relating to, or shaped like, an arrow.

S. Suture, the suture which unites the parietal bones. (Fig. 27.)

Saliva (se-lai'vą). The colorless ropy fluid in the mouth secreted by certain glands and glandular structures in the mouth; the spittle.

Salivation (s*al-i*-vê'shōn). An excessive flow of the saliva. The word is practically synonymous with ptyalism, but, strictly speaking, describes the condition when produced by the exhibition of medicines.

Saturated Solution (s*atsh*'iu-re-t*ed*). A solution which at a given temperature cannot contain more of the substance than it already contains.

Scalpel (sc*al*'p*el*). A small knife usually with a straight blade fixed firmly in the handle; used in dissection and in surgical operations. (Fig. 92.)

Scapula (sc*ap*'iu-lą). The shoulder-blade.

Scrotum (scrô'tum). [Latin, "bag."] A pouch at the base of the penis in the male, containing the testicles and other organs.

Sebaceous (si-bê'shius). Fatty; suety; applied to glands which secrete an oily matter resembling suet. Resembling or pertaining to sebum or fat.

Sebum (sî'bum). A thick, semi-liquid substance discharged upon the surface of the skin, composed of fat and broken-down epithelial cells.

Secretion (si-crî'shōn). 1. A function of the body by which various fluids or substances are separated from the blood, differing in different organs according to their peculiar functions: thus, the liver secretes the bile, the salivary glands the saliva, etc. 2. The substance secreted.

Secundines (s*ec*'un-d*ins*). The after-birth; the placenta, etc., expelled after the birth of a child. (See Fig. 67.)

Segmentation (s*eg*-m*en*-tê'shōn). The process of division by which the fertilized ovum multiplies before differentiation into layers occurs. (Fig. 18.)

Semen (sî'm*en*). 1. A seed. 2. The fluid secreted by the male reproductive organs.

Septic (s*ep*'t*ic*). Tending to putrefy; causing or due to putrefaction.

Sepsis (s*ep*'s*is*). 1. Putrefaction. 2. Infection and poisoning by putrefactive matter.

Serous (sî'rus). Of the nature of serum; secreting serum.

S. Membrane. See under *Membrane*.

Serum (sî'rum). The clear, straw-colored liquid which separates, in the clotting of blood, from the clot and the corpuscles.

Shock (shoc). A condition of sudden depression of the whole of the functions of the body, due to powerful impressions upon the system by physical injury or mental emotion. The former is termed *surgical* and the latter *mental* shock.

Show (shō). 1. Popularly, the red-colored mucus discharged from the vagina shortly before child-birth; called also "Labor-show." 2. The vaginal discharge in menstruation.

Sims's Position (sim'ziz). [J. Marion *Sims,* noted American gynæcologist, deceased.] That position of the patient in which she lies upon the left side and front of the left chest, with the right leg strongly flexed, or "drawn up:" called also *Semiprone position* and *Side position.* (Fig. 102.)

S.'s Speculum, a vaginal speculum with duck-bill blades: by it the posterior wall of the vagina is held up, while the anterior is depressed, the patient being placed in Sims's position. (Fig. 129.)

Skim Milk (scim). Milk from which the cream has been removed, leaving only one or two per cent. of fatty matter.

Smegma (smeg'mą). [From a Greek word meaning *soap.*] Sebum, especially the offensive, soap-like substance produced from the sebaceous follicles around the glans penis and prepuce and in the region of the clitoris and labia minora.

S. Embryo'num. Same as *Vernix Caseosa.*

Solution (so-liū'shōn). 1. The act of dissolving a solid body. 2. A clear, homogeneous liquid having particles of a solid, another liquid, or a gas uniformly diffused through it, so that the particles are invisible and do not separate upon standing.

Sordes (sōr'diz). Literally, "filth:" applied to the foul matter which collects on the teeth, particularly in certain low fevers.

Sound (saund). [French, *sonder,* to fathom, to try the depth of the sea; hence, to try or examine.] An instrument for introduction through the urethra into the bladder, or into any canal. (See Fig. 133.)

Specific (spi-sif'ic). 1. Relating to a species; distinguishing one species from another. 2. Suited for a particular purpose: as, a *specific* remedy. 3. Produced by a special cause. 4. A specific remedy; a remedy supposed to have a peculiar efficiency in the cure of a particular disease, or one which has a special action on some particular organ.

S. Disease, any disease produced by a special cause; as syphilis and the eruptive fevers. (The term is frequently, but wrongly, restricted to syphilis.)

S. Gravity, the weight of a body compared with that of another of equal volume taken as a standard: hydrogen is the standard for gases, and distilled water for liquids and solids.

Spermatozoön (spĕr''mā-to-zô'on). Pl. *spermatozoa.* The motile microscopic sexual element of the male, resembling in shape an elongated tadpole. (Fig. 17.) The male element in fecundation.

Sterile (ste*r'i*l). 1. Affected with sterility; barren. 2. Not containing micro-organisms; aseptic.

Sterility (ste-ril'ĭ-ti). Inability, whether natural or as the result of disease, to procreate offspring.

Sterilization (ste*r''i*l-*i*-zē'shŏn). The process of rendering an object sterile or free from micro-organisms or their germs.

Sterilizer (ste*r'i*l-ai-zĕr). An apparatus for sterilizing objects. (Fig. 173.)

Stillborn (sti*l*'bôrn). Born without life; born dead.

Stimulant (sti*m*'iu-lānt). 1. Stimulating. 2. A medicine having power to excite organic action or to increase the vital activity of an organ. A *stimulant* differs from a *tonic* in that its action is more speedy, more transitory, and usually followed by a reaction.

Stimulate (sti*m*'iu-lêt). To excite the organic action of a part of the animal economy.

Stimulus (sti*m*'iu-lŭs). Pl. *stimuli.* A Latin word signifying a "goad," "sting," or "whip." In physiology, that which rouses or excites the vital energies, whether of the whole system or of a part.

Stool (stûl). The fæces discharged from the bowels; a dejection; an evacuation.

Streptococcus (str*e*p-to-co*c*'us). A variety of micro-organism.

Stria (strai'ą). Pl. *striæ.* A Latin word signifying a "groove," "furrow," or "crease."

S. Gravidarum, shining, whitish lines upon the abdomen caused by pregnancy or distention by abdominal tumors. (Fig. 30.)

Stupor (stiû'pōr). A suspension or diminished activity of the mental faculties; loss of sensibility.

Styptic (sti*p*'ti*c*). Having the power of stopping bleeding through an astringent quality; hæmostatic.

Subcutaneous (sub-ciu-tê'ni-us). Situated just under the skin.

S. Injection. See *Hypodermic Injection.*

Suppository (su-po*z'i*-to-ri). A preparation of some substance (usually cacao butter) fusible at the temperature of the body, and combined with some medicinal substance, for introduction into the rectum, vagina, urethra, or other cavity of the body.

Suppuration (sup-iu-rê'shŏn). The formation of pus or the processes giving rise to it.

Suppurative (sup'iu-rê-ti*v*). Producing or discharging pus.

Suture (siû'tshur). 1. The junction of the bones of the cranium by a serrated line resembling the stitches of a seam. (Fig. 27.) 2. A stitch used to draw together the lips of a wound. 3. The thread or material used in making a stitch.

Syphilis (*sif'i-lis*). A contagious venereal disease, communicable by contact of any abraded surface with the virus in coition or otherwise, and also by heredity and from the mother to a fœtus.

Symphyseotomy (*sim"fiz-i-ot'o-mi*). The operation of severing the ligaments and the fibro-cartilages of the pubic symphysis; done in difficult labor.

Symphysis (*sim'fi-sis*). The union of bones by means of an intervening substance; a variety of synarthrosis.

S. Pubis, "symphysis of the pubis," the pubic articulation or union of the pubic bones which are connected with each other by interarticular cartilage. (Fig. 1.)

Synchondrosis (*sin-con-drô'sis*). A union of bones by intervening cartilage; a variety of synarthrosis. See *Articulation.*

Syncope (*sin'co-pi*). Literally a "cutting short" of one's strength; swooning or fainting; a suspension of respiration and the heart's action, complete or partial.

T-Bandage. A bandage shaped like the letter T,—especially one in which the transverse limb passes around the body and the longitudinal one under the perineum. Used to hold dressings against the vulva.

Tampon (*tam'pōn*). 1. A portion of gauze, sponge, etc., used in plugging a cavity or canal. 2. To apply a tampon to.

Tamponade (*tam-po-nêd'*). The use of the tampon or the act of using it.

Tamponage (*tam'pōn-êj*). See *Tamponade.*

Tamponing (*tam'pōn-ing*). The act of using a tampon.

Tenaculum (*ti-nac'iu-lum*). A small hook-shaped instrument.

T. Forceps, a volsella.

Tenesmus (*ti-nez'mus*). A constant desire to go to stool or to urinate, with painful straining without the expulsion of fæces or urine.

Testicle (*tes'ti-cl*). One of the two glands in the male contained in the scrotum.

Thoracic (*tho-ras'ic*). Belonging to the thorax.

Thorax (*thô'racs*). The chest, or that part of the body between the neck and the diaphragm and in the cavity of which are contained the heart and lungs.

Thrombosis (*throm-bô'sis*). The formation or progress of a thrombus.

Thrombotic (*throm-bot'ic*). Relating to or of the nature of thrombosis.

Thrombus (*throm'bus*). A clot formed in any part of the circulatory apparatus. It differs from an embolus in that it is developed at the point where it is found, while an embolus is brought from a distance through the blood-vessels.

Tissue (*tish'û*). A web-like structure; a collection of cells or elements, of a constant structure and function, which go to make up the body. Examples: muscular tissue; brain tissue; bone tissue, etc.

Torsion (tôr'shŏn). A twisting.

T. of the Umbilical Cord, the normal spontaneous twisting of the umbilical cord.

Toxæmia (*t*oc-sî'mi-ą). Blood-poisoning.

Toxæmic (*t*oc-sî'm*i*c). Relating to, or caused by, toxæmia.

Traction (tr*a*c'shŏn). The act of drawing or pulling.

Trendelenburg's Position or Posture (tr*e*n'd*e*-l*e*n-bûrgz). That position in which the patient is placed flat on the back with body and thighs elevated to an angle of about forty-five degrees, the legs hanging over the edge of the table. It is used in abdominal surgery so that the abdominal viscera may be kept out of the way by gravitation. (Fig. 108.)

Tubercle (tiû'bĕr-cl). A rounded eminence.

Tuberculosis (tiu-bĕr-ciu-lô's*i*s). A specific infectious disease due to the presence of the tubercle bacillus and affecting most often the respiratory and alimentary tracts, the peritoneum and parts of the brain. When the disease affects the lungs it is popularly known as "consumption."

Tumor (tiû'mọr). 1. A swelling. 2. A morbid growth of new tissue in any part of the body, not due to inflammation, and differing in structure from the part in which it grows. Tumors may be solid or hollow (*Cystic t.*). When a tumor tends to recur after removal, and infect the system, it is called *Malignant;* when it does not, *Benign, Innocent,* or *Non-malignant.*

Tympanites (t*i*m-p*a*-nai'tîz). Distention of the abdomen by gas in the intestines or in the peritoneal cavity; drum belly.

Uterine T., distention of the uterus with gas; physometra.

Typhoid State (tai'foid). A condition sometimes occurring in depressing diseases, in which there are great muscular weakness, brown tongue, muttering delirium, feeble pulse, and involuntary passage of urine and fæces.

Ulcer (ul'sĕr). A loss of substance on some internal or external surface from gradual disintegration and destruction of the tissue.

Ulcerate (ul's*ē*-rêt). 1. To form an ulcer in. 2. To become affected with ulcers.

Umbilical (um-b*il'i*-cāl). Pertaining to the umbilicus.

U. Arteries, the arteries which accompany and form part of the umbilical cord.

U. Cord [Latin, *funis umbilicalis*], the cord connecting the placenta with the umbilicus of the child, and at the close of gestation principally made up of the two umbilical arteries and the umbilical vein, encased in a mass of gelatinous tissue called "Wharton's jelly."

U. Hernia, hernia at or near the umbilicus.

Umbilicus (um-bi-lai'cus). The navel; the pit in the centre of the abdomen left by the shrinking of the umbilical cord.

Uræmia (iu-rî'mi-ą). The presence of urinary constituents in the blood, due to the suppression of the urine, and marked by headache, nausea, vertigo, eclampsia, and a peculiar odor of the skin.

Uræmic (iu-rî'mic). Relating to uræmia; affected with uræmia.

Urea (iû'ri-ą). The principal solid constituent of the urine. It is produced by the decomposition of proteids and carries off most of the nitrogenous products of the body. Urea is also found in the blood and lymph.

Urethra (iu-rî'thrą). The membranous canal forming a communication between the neck of the bladder and the external surface of the body. The female urethra does not exceed two inches in length, and the passage is considerably larger and more dilatable than that of the male.

Urethral (iu-rî'thrāl). Belonging to the urethra.

Urinal (iû'ri-nāl). A vessel to receive urine.

Urinalysis (iû-ri-nal'i-sis). Chemical analysis of the urine.

Urinary (iû'ri-ne-ri). Relating to the urine.

Urinate (iû'ri-nêt). To pass urine from the bladder.

Urination (iû-ri-nê'shōn). The act of passing urine.

Urine (iû'rin). The saline secretion of the kidneys which flows from them through the ureters into the urinary bladder.

- Incontinence of U., inability to retain the urine in the bladder, so that it escapes without the knowledge or control of the patient.
- Retention of U., inability to pass the urine which accumulates in the bladder.
- Suppression of U., arrested secretion of urine from the kidneys.

Urinometer, Urometer (iû-ri-nom'e-tĕr). An hydrometer for ascertaining the specific gravity of urine.

Uterine (iû'tē-rin). Relating to the uterus.

- U. Appendages, the ovaries and Fallopian tubes. (Fig. 11.)
- U. Colic, paroxysms of pain in the uterus due to menstruation or to other causes, such as "false pains" or "after-pains."
- U. Gestation, normal pregnancy.
- U. Inertia, deficiency of contractile power of the uterus in labor.
- U. Involution, the process by which, after child-birth, the uterus reassumes its normal size and shape.
- U. Mole, a mass sometimes occurring in the uterus, consisting of a dead fœtus which has undergone degeneration.
- U. Phlebitis, a form of puerperal fever.
- U. Pregnancy, normal pregnancy occurring in the uterus, as opposed to ectopic pregnancy.

U. Probe, a long, flexible probe for exploring the cavity of the uterus. (See Fig. 133.)

U. Sinuses, cavities formed by the uterine veins in the walls of the uterus; they are especially conspicuous in the pregnant uterus.

U. Sound, an instrument somewhat resembling a urethral sound, used in making examinations of the uterus; a uterine probe. (Fig. 133.)

U. Tubes, the Fallopian tubes. (Fig. 11.)

U. Wound, the area of the uterus from which the placenta has been detached.

Uterus (iû'tē-rus). The womb, a hollow muscular organ designed for the lodgement and nourishment of the fœtus during its development until birth. (Figs. 9, 10, and 11.)

Vagina (ve-jai'nạ). [Latin, a sheath.] The curved canal, five or six inches in length, extending from the vulva to the uterus. (Fig. 9.)

Vaginal (*vaj'i*-năl). Belonging or relating to the vagina.

V. Examination, examination of the vagina by introducing a finger. (Fig. 56.)

V. Speculum, an instrument for keeping open the vagina in order that its interior may be viewed. (Figs. 129 and 130.)

Varicose (*var'i*-côs). Unnaturally dilated; relating to a varix.

Varicosity (*var-i-cos'i-ti*). 1. A varicose condition of the veins; varicosis. 2. A varicose vein; a varix.

Varix (vê'rics). A dilatation of a vein. (Fig. 33.)

Vascular (*vas'*ciu-lạr). Having, or relating to, vessels; full of blood-vessels.

Vascularity (*vas*-ciu-l*ar'*i-t*i*). The state or property of being vascular.

Vectis (*vec'tis*). The lever. In obstetrics, an instrument resembling one blade of an obstetrical forceps, for making traction upon the head of the fœtus in retarded labor. Seldom used and never seen now, as a single forceps blade answers the same purpose.

Vein (vên). A tube conveying blood from the various tissues of the body to the heart.

Venous (vî'nus). Relating to the veins; contained in the veins.

V. Blood, a dark-colored liquid collected in the veins from every part of the system. It is subsequently exposed to the influence of the air in the lungs and is converted into bright red arterial blood. It contains more carbonic acid gas and less oxygen than arterial blood.

V. Circulation, the circulation of the blood through the veins.

V. Congestion, the engorgement of an organ with venous blood caused by interference with its return to the heart.

Vernix Caseosa. "Cheesy Varnish." The layer of fatty matter which covers the skin of the fœtus.

Version (vĕr'shōn). The act of turning; specifically, a turning of the child in the uterus so as to change the presenting part and bring it into more favorable position for delivery. (Figs. 71 and 72.)

Vertebra (vĕr'ti-brą). Pl. *vertebræ*. A peculiarly shaped bone, thirty-two of which compose the spine or vertebral column.

Vertex (vĕr'tecs). The summit or top of anything. In anatomy, the top or crown of the head.

V. Presentation, presentation of the vertex of the fœtus in labor. (Fig. 41.)

Vertigo (vĕr'ti-gô). Dizziness; swimming of the head; giddiness.

Vesical (ves'i-cāl). Pertaining to the bladder; having the appearance of a bladder.

Viability (vai-ā-bil'i-ti). Ability to live.

Viable (vai'ā-bl). A term in medical jurisprudence signifying "able or likely to live:" applied to the condition of the child at birth.

Virgin (vĕr'jin). A woman who has never had sexual intercourse.

Virulent (vir'iu-lēnt). Poisonous; malignant; caused by virus or having the nature of virus.

Virus (vai'rus). Any poisonous matter produced by disease and capable of propagating that disease by inoculation; a deleterious agent supposed to be a parasitic organism or germ.

Viscus (vis'cus). Pl. *vis'cera*. Any organ contained in the cavities of the body, especially within the abdomen.

Visual (vizh'iu-āl). Pertaining to, or used in, vision or sight.

Vital (vai'tāl). Belonging or essential to life.

Vitality (vai-tal'ī-ti). The principle of life.

Volsella (vol-sel'ą). A forceps each blade of which has hooked extremities; a volsellum.

Vulsella, Vulsellum (vul-sel'ą, vul-sel'um). See *Volsella*.

Vulva (vul'vą). The external genitals of the female. (Fig. 8.)

Walcher Position or Posture (vâl'cĕr or wâl'tshĕr). That position of the patient in which she lies on her back with her buttocks raised and well over the edge of the table and her limbs hanging down as much as possible. (See Fig. 75.) In this position the true conjugate diameter of the pelvis is lengthened by nearly half an inch.

Wet-Nurse. One who gives suck to the child of another.

Wharton's Gelatin or Jelly (hwôr'tōnz). [Thomas *Wharton*, English anatomist, died 1673.] The jelly-like mucous tissue composing the bulk of the umbilical cord.

Whites (hwaits). A popular name for *Leucorrhœa*, which see.

Winckel's Disease (*v*inc'ēlz). A very rare and extremely fatal disease of new-born infants, marked by icterus, hemorrhage, bloody urine, and cyanosis. Malignant jaundice.

Witches' Milk (*w*itsh'ēz). A milky fluid secreted from the breast of the newly born.

Womb (wûm). The *Uterus,* which see.

INDEX

Abdomen, pigmentation of, 68, 102
size of, 102, 103
Abdominal binder. See *Binder*, 123, 234
changes, 102
flattening, 102
pregnancy, 93
supporter, 235
Abortion, 261
after treatment, 269
most common cause of, 97
Accidental hemorrhage, 202
Accidents and emergencies, 201
Active fetal movements, 103
After-birth, expulsion of, 165
After-coming head, delivery of, 173
After-pains, 226
Air embolism, 221
"Air hunger," 91
Albuminuria, symptoms of, 83
Amnion, 46, 47
Amniotic sac, 46
formation of, 46
functions of, 47
layers of, 47
Amount of food for premature infant, 297
Anæmia, 79
of pregnancy, 79
onset of, 79
symptoms of, 79
treatment of, 79
Analysis of milk, 320
of urine in pregnancy, 116
Ankylosis, pelvic, 25
Anointing the infant after birth, 271
Appetite after labor, 227
in pregnancy, 67
in puerperium, 227
Areola of the breast, 36
Arm presentation, 138
Arnold sterilizer, 337
Arteries, hypogastric, 59
umbilical, 56
Articulation, sacro-coccygeal, 24
Articulations of pelvis, 24
Artificial feeding, 325
of premature infant, 298
respiration, 211
Ascites, 80
treatment of, 80
Asphyxia neonatorum, 210
causes of, 210
treatment of, 211
varieties of, 211
Ass's milk, 326
Axis-traction forceps, 182

Baby clothes, 127, 280
foods, 325
"seven months," 139
"Baby-food babies," 326
Bacteria in nursery, 285
Bad milk, effect on infant, 322
Bag, Barnes's, 184
Champetier de Ribes, 184
of membranes, 47
Ballottement, 103
Barley-water, 334
Barnes's bag, 184
Basiotribe, 196
Basket, for premature infant, 290
Bassinette, 146

Bath, infant's, 274
temperature of, 110
shower, 110
Bathing, 110
in pregnancy, 110
in puerperium, 245
of premature infant, 294
sea, 110
spray, 110
surf, 111
Bed, care of, 238
preparation for labor, 147
Bed-pads, 123
Bedroom in pregnancy, 111
Bicycling, 109
Binder, 234
abdominal, 123, 234
flannel, for baby, 126
for breasts, 258
function of, 234
Bipolar version, 178
Birth-marks, 341
Birth of child, 165
of head, 168
Bladder, irritability of, 79, 99
Bleeding, from infant's vagina, 307
from navel, 286
Blood, in milk, 323
of pregnancy, 65
poisoning, 262
"Blue babies," 308
Bottled milk, 327
Bougie, 199
Bowels in puerperium, 242
Braun's hook, 197
Braxton-Hicks version, 178
Breast-binder, 256
pattern of, 257
Breast feeding, 311
first meal, 312
hours for nursing, 313
indications for stopping, 323
milk, 310
Breast milk, effect of fright, 323
of menstruation, 323
of nervous shock, 323
of pain, 323
of worry, 323
insufficiency of, 318
causes of, 319
methods of increasing, 320
quality of, 318
quantity of, 319
Breast-pump, 295
care of, 297
method of use of, 295
Breasts, "caked," 320
care of, 311, 314
care in last weeks, 117
changes due to pregnancy, 64
diseases of, 252
dragging of, 315
eczema of, 258
inflammation of, 254
massage during pregnancy, 117
in puerperium, 253
method of "drying up," 339
pigmentation of, 65, 101
striæ of, 64, 117
Breech case, diagnosis of, 173
diagnosis of, 138
management of, 172
presentation, 134
Brim of pelvis, 23
Brow presentation, 134
Bulb and valve syringe, 187
Buttocks, chafing of, 282
"scalding" of, 282

Cæsarean section, 27, 186
assistants needed, 188
dangers of, 186
in private practice, 190
indications for, 187
nurses needed, 188
preparation of patient, 188
"Caked" breasts, 320

Calisthenics, 109
Caput succedaneum, 300
Care of breast-pump, 297
of breasts, 311
of instruments, 233
of nipples, 311
of normal infant, 271
of nursing bottles, 334
Cascara sagrada, dose of, 75
Castor oil in pregnancy, 75
Catheter, best kind, 240
method of use, 240
sterilization of, 240
withdrawal of, 242
Catheterization, difficulties after labor, 240
in puerperium, 239
Cause of labor, 138
Cavity of the uterus, 32
Centrifugal cream, 328
Cephalhæmatoma, 302
Certified milk, 327
Cervical laceration, hemorrhage from, 214
Cervix, dilatation of, 184
immediate repair, 215
uteri, 32
Cessation of menstruation, 99
Chafing of buttocks, 282
Champetier de Ribes bag, 184
"Change of life," 42
Chapin dipper, 330
Chemistry of milk, 320
Child, asphyxia of, 210
birth of, 165
Child-bed fever, 248
Chill following labor, 224
in puerperium, 224
Chloasmata, 68
Chloroform, administration of, 159
Esmarch inhaler, 160
in labor, 158
"Chloroform cough," 161
Chorea, 72
Chorion, 47
Circulation, fetal, 58
Clitoris, 28
Clothing for infant, 127, 280
for premature infant, 288
in pregnancy, 105
Coccyx, 23
Colostrum, 65, 101
corpuscles, 65
Combined version, 178
Concealed hemorrhage, 90, 95, 202
Conception, 45
Condensed milk, 326
Conduct of labor, 151
of third stage, 172
"Cone" for administering ether, 162
Confinement, 139
Congenital cyanosis, 308
Constipation, after labor, 227
in pregnancy, 74
in puerperium, 227
treatment of, 115
Contraction of pelvis, 25
Control of sex, 343
Convulsion, eclamptic, 85
treatment of, 88
uræmic, 113
Cooke Maternity Outfit, 127
incubator, 279
Cord about neck, 168
dressing of, 271
hemorrhage from, 299
ligation of, 169
prolapse of, 207
secondary hemorrhage from, 222
separation of, 286
umbilical, 47
Corsets, 105
Cotton jacket, for premature infant, 288
when changed, 294
Cough, 81

Cough from chloroform, 161
in pregnancy, 67
Cow's milk, 327
composition of, 328
modification of, 328
Cranioclast, 196
Craniotomy, 183, 195
Cream, centrifugal, 328
gravity, 328
Croquet, 109
Crusts on scalp, 283
Cry of premature infant, 293
Crying baby, 284
Curd of milk, 320
Curettage, 263
dressings needed, 268
instruments used, 264
light for, 268
position of nurse, 269
preparations for, 264
table for, 267
Cyanosis in new-born infant, 308

Dance, St. Anthony's, 82
St. John's, 82
St. Vitus's, 82
Dancing, 110
Danger of ophthalmia neonatorum, 303
Dangers of abortion, 262
of Cæsarean section, 186
of embolism, 221
of forceps, 182
of miscarriage, 204, 262
of placenta prævia, 94
of post-partum hemorrhage, 221
of version, 180
Date of labor, 104
Davidson syringe, 184
Death of fœtus, 204
Decapitation, 196
Décolleté gowns, 117
in pregnancy, 107
Decidua, 45
of pregnancy, 45
reflexa, 46
serotina, 45, 46
vera, 45
Deformity of pelvis, 26
Delivery, 139
by forceps, 180
by the nurse, 166
by version, 177
of after-coming head, 173
of breech, 173
of placenta, 172
of shoulders, 168
of twins, 174
operative, 177
rapid, 200
Development of fœtus, 53
of premature infant, 298
Diagnosis of breech, 173
Diaper for premature infant, 288
method of applying, 280
Diapers, 126
Diarrhœa in pregnancy, 75
treatment of, 116
Diet after labor, 245
in pregnancy, 112
in puerperium, 245
Diet-sheet for pregnant woman, 114
Digestive organs in pregnancy, 67
Dilatation of cervix, 184
Dipper, Chapin, 330
Discipline of infant, 284, 285
Diseases of the heart, 79
of new-born infant, 302
Disinfection of the hands, 167
Dislocations at birth, 300
Disorders of pregnancy, 71
of puerperium, 248
Displacements of the uterus, 83
Dose of cascara sagrada, 75
Douche, vaginal, 243
amount of, 244

Douche, temperature of, 244
"Dragging" of the breasts, 315
Dressing the cord, 272
Drinking-water for infant, 286
Driving, 109
Dropsy, 80
  treatment of, 80
Drugs excreted by milk, 339
"Dry up" breasts, 339
Ductus arteriosus, 60
  venosus, 60
Duration of labor, 143
Dyspnœa in pregnancy, 67, 76

Eclampsia, 84, 201
  cause of, 84, 113
  character of convulsions, 85
  diagnosis of, 85
  in puerperium, 213
  symptoms of, 84
  treatment of, 87
  treatment of convulsions, 87
Ectopic gestation, 91
    causes, 91
    hemorrhage in, 203
    management by nurse, 203
    symptoms, 92
      of rupture of sac in, 203
    time of rupture, 203
    treatment, 93
    varieties, 92
Eczema of breast, 258
"Eight per cent. milk," 331
Elliott forceps, 182
Embolism, 221
  air, 221
  dangers of, 221
  symptoms of, 221
  treatment of, 221
Embryo, 50
  at four weeks, 51
Embryotomy, 194
  indications, 194
Emergencies, 201
English breast-pump, 295
Epilepsy, 87
Episiotomy, 193
Eruptive fevers, 96
Esmarch apparatus for administering chloroform, 160
Ether, administration of, 163
  in labor, 162
  "cone," 162
Evisceration, 197
Examination of milk, 321
  of urine, 69
  vaginal, 156
Excretive organs in pregnancy, 67
Exercise, 107
  amount in pregnancy, 108
  bicycling, 109
  calisthenics, 109
  croquet, 109
  driving, 109
  games, 109
  golf, 109
  horseback riding, 109
  out-door, 109
  ping-pong, 110
  tennis, 109
  walking, 109
Expulsive forces of labor, 129
Extension, 132
External hemorrhage, 202
  organs of generation, 28
  os, 28
  pelvimetry, 26
  rotation, 132
  version, 178
Extra-uterine pregnancy, 92

Face presentation, 133
Fainting, 81
  in pregnancy, 201
Fallopian tubes, 31, 43
False labor-pains, 152
Fat in milk, 320

Feeble infants, 287
"Feeder" for premature infants, 296
Feeding, artificial, 325
mixed, 325
"Ferris waist," 105
Fetal circulation, 57
development, 43, 51
heart, 104
skull, 54
Fever, child-bed, 248
"milk," 227
puerperal, 248
scarlet, 96
Fevers, eruptive, 96
"Figure-of-eight" ligature, 222
First stage, conduct of, 154
Fissure of nipple, 252
Flannel binder for baby, 126
Flattening of abdomen, 102
Flexion, 132
Flowers in lying-in room, 246
Fœtus, 50
at four weeks, 51
at three months, 51
at six months, 50
at seven months, 53
at eight months, 53
at nine months, 53
at term, 53
circulation of, 58
death in utero, 204
development in multiple pregnancy, 61
development of, 51, 53
head of, 53
nourishment of, 56
overgrowth of, 112
position in utero, 53
skull of, 51
Follicle, Graafian, 37
Fontanelles, 55
Food for premature infant, 295
Foot presentation, 138
Foramen ovale, 59
Forceps, axis-traction, 182
dangers of, 182
delivery by, 180
Elliott, 182
high, 180
indications for, 184
low, 180
medium, 180
paralysis from, 300
position of patient, 182
preparations for, 181
pressure from, 300
Simpson, 182
sterilization of, 184
Tucker-McLane, 182
types of, 182
Formaldehyde fumigator, Lister's, 145
Fornix, 26
"Four per cent. milk," 328
Fractures at birth, 300
Freeman pasteurizer, 338
Fright, effect on breast milk, 323
Fumigation, 145
Fundus, management after labor, 228
in third stage, 169
relaxation of, 229
uteri, 32
Funis, 48
Furniture of lying-in room, 145
of nursery, 285

Gait in pregnancy, 69
Galbiati knife, 192
Games, 109, 110
Garters, 107
Generation, external organs of, 28
internal organs of, 29
"Gertrude" garments for infants, 127
Gestation, ectopic, 93
multiple, 61

Glands, mammary, 35
of Montgomery, 65
Goat's milk, 326
Golf, 109
Gowns, décolleté, 107, 117
Graafian follicle, 37, 43
Granny knot, 171
Gravity cream, 328
Guaranteed milk, 327

Hair, growth during pregnancy, 67
Hands, disinfection of, 167
Head, birth of, 168
delivery in breech case, 173
injuries at birth, 300
Headache, 81
Heart clot, 221
diseases of, 79
failure in labor, 207
palpitation of, 56, 71
Heart-sounds, fetal, 104
Hemorrhage, 90
accidental, 202
concealed, 91, 95, 202
during pregnancy, 201
external, 202
internal, 96
from cervical laceration, 214
from cord, 222, 299
from navel, 222
general treatment of, 90
post-partum, 215
symptoms of, 91
unavoidable, 202
varieties of, 90, 91
Hemorrhoids, 78
treatment of, 78
Hernia, umbilical, 307
High forceps, 180
Horseback riding, 109
Hours for nursing, 313
Hypogastric arteries, 59
Hysterin, 87

Icterus neonatorum, 292, 304
Ilium, 22
crest of, 23
Impacted shoulder presentation, 197
Impregnation of ovum, 43
usual site of, 43
Impressions, maternal, 341
Inclined planes of pelvis, 131
Incubator, 291
principle of, 291
temperature of, 293
ventilation of, 292
Indications for Cæsarean section, 187
for embryotomy, 194
for forceps, 184
for version, 184
In-door exercise, 109
Induction of labor, Krause method, 199
of premature labor, 199
Infant, anointing, 271
at term, length of, 53
weight of, 53
bleeding from vagina, 307
care of, 271
clothing, 127, 280
congenital cyanosis, 308
crying, 284
discipline of, 284, 285
diseases of, 302
dislocations at birth, 300
drinking-water for, 286
effect of bad milk, 322
feeble, 287
feeding, 310
care of breasts and nipples, 311
methods of, 310
mother's milk, 311
sugar solution, 312
wet-nurse, 324
first bath, 273
first outings, 285

Infant, fractures at birth, 300
gain in weight, 317
hernia at navel, 307
inflammation of breast, 305
initial loss of weight, 317
injuries to, 300
jaundice of, 304
length of, 53
"lockjaw," 308
loss of weight, 317
"marked," 341
mastitis, 305
night-gown, 283
opisthotonos, 308
outfit, 125
playing with, 285
premature, 287
regurgitation, 317
rocking to sleep, 284
sleep, 284
tetanus, 308
trismus, 308
umbilical hernia, 307
vegetations, 308
undeveloped (see premature), 287
vaginal discharge, 307
visitors, 285
vomiting, 317
weight of, 53
Infant's bath, management of, 278
preparations for, 274
temperature of, 276
food, amount at each feeding, 333
preparation of, 331
sleep, training, 284
Inflammation of breast, 254
in new-born infant, 305
Infusion, saline, 220
Injuries to infant, 300
to infant's head, 300
Inlet of pelvis, 24
Insanity, 258
Insanity during labor, 259
of lactation, 259
of pregnancy, 258
of puerperium, 258
puerperal, 258
treatment of, 259
Insomnia, 81
Instruments, care of, 233
Internal hemorrhage, 96
organs of generation, 29
os, 33
pelvimetry, 27
version, 180
Interstitial pregnancy, 92
Intertrigo, 282
Introduction of catheter, 240
Inversion of uterus, 206
Involution of uterus, 117, 225
Irritability of bladder, 79, 99
Ischium, 23
Itching, 82

Jaundice of the new-born, 304
Joints of pelvis, 24

Kelly pad, 157
Knee-chest position, 209
Knot, Granny, 171
square, 170
Krause method of inducing labor, 199

Labia majora, 28
minora, 29
Labor, appetite after, 227
cause of, 138
chill following, 224
chloroform in, 158
conduct of, 152
of first stage, 154
of second stage, 158
of third stage, 172
constipation after, 227
date of, 104

Labor, diet after, 245
duration of, 143
ether in, 162
expulsive forces of, 129
induction of, 199
heart failure in, 207
insanity during, 259
mechanism of, 129
normal, 152
phenomena of, 139
of first stage, 141
of second stage, 142
of third stage, 143
precipitate, 175
premature, 261, 269
premonitory symptoms of, 138
preparations for, 144
probable date of, 140
pulse after, 224
resistant forces of, 129
stages of, 141
symptoms of, 140
temperature after, 225, 244
unassisted, 152
uterus after, 225
Labor-pains, 141
false, 152
true, 153
Lacing in pregnancy, 106
Lactation, insanity in, 259
Lactose, 320
Lead poisoning, 97
Leg-holder, Cooke's, 264
Robb's, 264
Length of normal infant, 53
Leucorrhœa, 82
Ligature, figure-of-eight, 222
Ligation of cord, 169
Light for premature infant, 294
Linæ albicantes, 64
Liquor amnii, 46
Lister's formaldehyde fumigator, 145
Lithotomy position, 263
Lochia, 226
amount of, 226
character of, 226
odor of, 226
return of, 226
suppression of, 226
"Lockjaw," 308
Locked twins, 174
Low forceps, 180
Lubrichondrin, 241
Lungs in pregnancy, 65
Lying-in, 139
room, choice of, 144
fumigation of, 145
furniture of, 145
preparation of, 145
ventilation of, 246
state, 224

Malaria, 97
Male element, 43
Mammæ, 35
Mammary changes, 101
glands, 35
Management of breech cases, 172
of pregnancy, 105
of puerperium, 228
Mania, puerperal, 258
Massage of breasts, 253
in pregnancy, 117
of nipples, 117
Mastitis, 255
occurrence of, 255
of infants, 305
symptoms of, 256
treatment of, 256
Maternal impressions, 341
Maternity charts, 122
outfit, Cooke's, 127
Meatus urinarius, 29
Mechanism of labor, 129
Meconium in breech presentation, 135
Medium forceps, 180

Melancholia, puerperal, 259
Membranes, artificial rupture of, 168
bag of, 47
Menopause, 42
and pregnancy, 42
symptoms of, 42
Menstruation, 37, 39
abnormal, 39
amount of, 39
cessation of, 99
characteristics of, 39
duration of, 39
effect on breast milk, 323
normal, 40
phenomena of, 39
regularity of, 39
symptoms of, 39
types of, 40
Milk, ass's, 326
blood in, 323
bottled, 327
certified, 315, 327
chemistry of, 320
condensed, 326
curd of, 320
drugs excreted by, 339
"eight per cent.," 331
examination of, 321
fat in, 320
"four per cent.," 328
from herd, 327
goat's, 326
guaranteed, 327
one cow's, 326
pasteurization of, 338
proteids in, 320
pus in, 323
sterilization of, 336
sugar in, 320
to "dry up," 339
top, 329
"twelve per cent.," 329
"Milk fever," 227
"Milk leg," 257
Milk-sugar, 320
Miscarriage, 261
after treatment, 269
causes of, 261
dangers of, 204, 262
prevention of, 192, 204
symptoms of, 204, 261
threatened, 204
treatment of, 262
Mixed feeding, 325
Mons veneris, 28
Montgomery, glands of, 65
tubercles of, 65
"Morning sickness," character of, 100
treatment of, 71
vomiting, 99
Mother's mark, 341
milk, 311
normal, 321
Multiple gestation, 62
Mutilating operations, 194

Nausea of pregnancy, 71
Navel, 48
bleeding from, 286
rupture at, 307
secondary hemorrhage, 222
Nervous disorders in pregnancy, 69, 116
shock, effect on milk, 323
Neuralgia, 81
Night-gown, infant's, 283
Nipple shield, 254
Nipples, care of, 311
in pregnancy, 117
depressed, 117
diseases of, 117, 252
erosions of, 117
fissures of, 117, 252
flat, 117
massage of, 117
size of, 334

Nipples, small, 117
syphilis of, 258
Noise and premature infants, 294
Normal infant, care of, 271
labor, 152
mother's milk, 321
Nurse, delivery by, 166
Nurse's outfit, 119
position for curettage, 269
room, 246
Nursery, bacteria in, 285
furniture of, 285
temperature of, 285
ventilation of, 276, 285
Nursing-bottles, 333
care of, 334
hours for, 313

Oatmeal-water, 334
Obstetrical pads, 123
Œdema of lower limbs, 78
One cow's milk, 326
Operative delivery, 177
Ophthalmia neonatorum, 303
causes of, 303
dangers of, 303
prevention of, 303
symptoms of, 303
treatment of, 303
Opisthotonos, 308
Os, external, 33
internal, 27
Osmosis, 47, 54
Outer garments in pregnancy, 107
Outfit for infant, 125
for mother, 123
for nurse, 119
Outings for infant, 285
Ovary, 33, 43
Overgrowth of fœtus, 112
Ovulation, 37, 38
Ovule, 33
Ovum, 37, 43
at four weeks, 49
Ovum, impregnation of, 38
interior of, 43
segmentation of, 44

Pads for the bed, 123
for the vulva, 124
obstetrical, 123
sanitary, 124
Pain, causes of, 91
effect on breast milk, 323
in pregnancy, 91
Pains, false, 152
of labor, 141
true, 153
Palpitation of the heart, 65, 81
Paralysis, 81
from forceps, 300
Parturition, 139
Passive fetal movements, 103
Pasteurization of milk, 338
Pasteurizer, Freeman's, 337, 338
Patient's outfit, 123
Pelvic contraction, 27
Pelvimeter, 26
Pelvimetry, importance of, 26
external, 26
internal, 27
Pelvis, 22
articulations of, 24
brim of, 23
deformed, 26
inclined planes of, 131
in pregnancy, 69
inlet of, 23
joints of, 24
male and female, 24
Perforator, 196
Perineum, 33
prevention of laceration, 167
Pernicious vomiting, 72
Phenomena, emotional, of pregnancy, 100
mental, of pregnancy, 100
of labor, 139

Phlegmasia alba dolens, 251
Physician, when summoned to labor, 149
Physiology of pregnancy, 64
of the puerperium, 224
Pigmentation of abdomen, 68
of breasts, 68, 101
Piles, 78
Ping-pong, 110
Placenta, 38, 47
birth of, 165
delivery of, 172
formation of, 49
in twin cases, 60
prævia, 93
central, 93
dangers of, 94
hemorrhage from, 94
lateral, 94
marginal, 94
symptoms of, 94
treatment of, 94
retained, 213
Placental attachment, 94
Playing with infant, 285
Pneumonia, 95
Poisoning, by lead, 96
by sewer-gas, 96
Position, 129
knee-chest, 209
lithotomy, 263
of nurse for curettage, 269
Sims's, 199
Trendelenburg, 209
Walcher, 182
Positive signs of pregnancy, 99
Post-partum hemorrhage, 215
causes of, 215
treatment of, 206, 217, 218
Precipitate labor, 175
Pregnancy, abdominal, 92
abdominal changes in, 102
markings in, 102
accidents, emergencies of, 201
Pregnancy, albuminuria of, 83
appetite in, 67
ascites in, 80
bedroom in, 111
blood changes in, 66
breast changes in, 101
castor oil in, 75
chorea in, 82
clothing in, 105
constipation in, 74, 115
corsets in, 105
cough in, 67, 81
craving for unusual food, 114
dancing in, 110
decidua of, 45
décolleté gowns in, 107, 117
diarrhœa in, 65, 116
diet in, 112
diet-sheet during, 114
digestive organs in, 67
disorders of, 71
dropsy in, 80
duration of, 139
dyspnœa in, 67, 76
eclampsia in, 84
effect on milk, 323
eruptive fevers in, 95
excretive organs in, 67
exercise in, 107
extra-uterine, 91
fainting in, 81, 201
gait in, 69
garters in, 107
growth of hair during, 67
headache in, 81
hemorrhage in, 89, 95, 201
hemorrhoids in, 78
insanity of, 258
insomnia in, 80
interstitial, 92
itching in, 82
lacing in, 106
last two months of, 116

Pregnancy, leucorrhœa in, 82
lungs in, 66
malaria in, 95
management of, 105
maximum duration of, 139
mental and emotional phenomena of, 100
minimum duration of, 139
nausea of, 71
nervous affections of, 69
condition in, 116
neuralgia in, 81
outer garments in, 107
palpitation in, 81
paralysis in, 81
pelvic changes in, 69
physiology of, 62
pneumonia in, 96
positive signs of, 99
presumptive signs of, 99
probable signs of, 99
pruritus in, 82
ptyalism in, 82
quinine in, 96
salivation in, 82
scarlet fever in, 95
secretive organs in, 67
sewing-machine in, 110
signs and symptoms of, 98
skin in, 67
skin markings of, 68
sleep in, 111
syncope in, 81, 201
syphilis in, 96
teeth in, 111
temperature in, 67
tubal, 92
tuberculosis in, 97
underwear in, 106
urinary analyses in, 116
urine of, 69
uterine displacement in, 83
varicose veins in, 76
vomiting of, 71, 99
Pregnancy, walking in, 107
"whites" in, 82
woollen-wear in, 106
Premature infant, 287
amount of food for, 297
artificial feeding of, 298
bathing, 294
cord dressing, 287
cotton jacket for, 288
cry of, 293
development of, 298
diapers for, 288
"feeder" for, 296
food for, 295
in basket, 290
incubator for, 291
light for, 294
manipulation of, 294
noise, 294
rest for, 294
skin of, 294
temperature of, 295
turban for, 290
visitors to, 295
weight of, 287, 295
labor, 261, 269
induction of, 199
Premonitory symptoms of labor, 139
Preparations for Cæsarean section, 188
for curettage, 264
for forceps, 181
for labor, 144
for labor—last moments, 149
for symphyseotomy, 192
for version, 179
Presentation, 129
arm, 138
breech, 134
brow, 134
face, 133
foot, 138
impacted shoulder, 197

Presentation, shoulder, 138
vertex, 130, 131
Pressure from forceps, 300
Presumptive signs of pregnancy, 99
Prevention of miscarriage, 204
Probable date of labor, 138
signs of pregnancy, 99
Prolapse of cord, 207
treatment of, 209
Promontory of sacrum, 23
Proteids in milk, 320
Pruritus, 82
Ptyalism, 80
treatment of, 80
Puberty, 40
management of, 41
phenomena of, 41
Pubis, 23
symphysis, 24
Puerperal fever, 248
cause of, 248
onset, 249
symptoms of, 249
treatment of, 249
varieties of, 248
insanity, 258
mania, 258
melancholia, 259
septicæmia, 248
state, 224
Puerperium, accidents and emergencies of, 213
appetite in, 227
bathing in, 245
bowels in, 242
care of bed, 238
catheterization in, 239
chill in, 224
comfort of patient, 245
constipation in, 227
diet in, 245
disorders of, 248
eclampsia in, 213
Puerperium, flowers, 246
insanity of, 258
management of, 228
of fundus, 228
massage of breasts, 253
patient's toilet, 231
physiology of, 224
pulse in, 224
retention of urine in, 227
temperature in, 225, 244
urination in, 239
uterus in, 225
vagina in, 226
visitors, 246
vulva in, 226
Pulse after labor, 224
in puerperium, 224
Pus in milk, 323

Quadruplets, formation of, 60
frequency of, 60
Quinine in pregnancy, 97

Rapid delivery, 200
Record charts for nurses, 122
Regurgitation, 317
Relaxation of fundus, 229
Resistant forces of labor, 129
Respiration, artificial, 211
Rest for premature infant, 294
Restitution, 132
Retained placenta, 213
Retention of urine, 227
Rocking infant, 284
Room for nurse, 246
Rotation, external, 132
Rupture of ectopic sac, 202
of uterus, 205

St. Anthony's dance, 82
St. John's dance, 82
St. Vitus's dance, 82
Sacro-coccygeal articulation, 24
Sacro-iliac synchondrosis, 24

Sacrum, 23
promontory of, 23
Saline infusion, 220
Salivation, 80
treatment of, 80
Salt water still bathing, 110
surf bathing, 111
Sanitary pads, 124
"Scalding" of buttocks, 282
Scalp, crusts of, 283
Scarlet fever, 96
Seborrhœa capitis, 283
Second stage, conduct of, 158
Secretive organs in pregnancy, 67
Section, Cæsarean, 186
Segmentation, 44
Separation of umbilical cord, 286
Septicæmia, puerperal, 248
"Seven months baby," 139
Sewer-gas poisoning, 97
Sewing-machine, use in pregnancy, 110
Sex, control of, 343
Shoulder presentation, 138
Shoulders, delivery of, 168
Shower bath, 110
Signs and symptoms of pregnancy, 98
Simpson forceps, 182
Sims's position, 199
Size of abdomen at different months, 102, 103
of nipple, 334
Skin in pregnancy, 67
of premature infant, 294
markings in pregnancy, 68
Sleep, 111
infant's, 284
"Sloane Maternity" Measuring-Glass, 333
Soap, Synol, 124
tincture of green, 124
"Soft spot," 55
Sounds of fetal heart, 104
Spermatozoa, 38
Spermatozoön, 43
Spina bifida, 305
Spray, 110
Square knot, 170
Stages of labor, 141
State, lying-in, 224
puerperal, 224
Sterilization of catheter, 240
of forceps, 184
of milk, 336
Sterilizer, Arnold's, 337
Striæ gravidarum, 64
of breasts, 66, 117
Subinvolution of uterus, 225
Sugar in milk, 320
of milk, 320
solution, 312
Supporter, abdominal, 235
Surf bathing, 111
Symphyseotomy, 192
after care, 193
bed, 193
knife, 192
preparation of patient, 192
Symptoms of labor, 140
of miscarriage, 204
Syncope, 81, 201
Synchondrosis, sacro-iliac, 24
"Synol Soap," 124
Syphilis, 97
frequency of, 97
of nipple, 258
Syringe, bulb and valve, 185
Davidson, 184
fountain, 233

Tampon, uterine, 219
Teeth, care of in pregnancy, 111
Temperature after labor, 225, 244
in pregnancy, 67
in puerperium, 225, 244
of incubator, 293
of infant's bath, 276

Temperature of nursery, 285
of premature infant, 287, 295
Tenesmus, vesical, 79
Tennis, 109
Tetanus, 308
Threatened miscarriage, 204
Third stage, conduct of, 172
Tincture of green soap, 124
Top milk, 329
Trendelenburg position, 209
Triplets, formation of, 53
frequency of, 61
Trismus, 308
True labor-pains, 153
Tubal pregnancy, 92
Tuberculosis, 95
Tubercles of Montgomery, 65
Tubes, Fallopian, 33
Tucker-McLane forceps, 182
Turban for premature infant, 290
"Twelve per cent. milk," 329
Twins, 61
causation of, 61
delivery of, 174
formation of, 61
frequency of, 61
locked, 174
placental formation, 61
sex of, 61

Umbilical arteries, 60
cord, 47
dressing, 272
formation of, 47
hemorrhage from, 299
separation of, 286
hernia, 307
vegetations, 308
Umbilicus, 47
in pregnancy, 64
Unassisted labor, 151
Unavoidable hemorrhage, 202
Underwear in pregnancy, 106
Uræmic convulsions, 113
Urethra, 29
Urination in puerperium, 239
Urine, analyses in pregnancy, 116
examinations of, 69
of pregnancy, 69
retention of, 227
Uterine tampon, 219
Uterus, 29
after labor, 225
body of, 32
cavity of, 32
cervix, 32
displacements of, 83
fundus, 32
in puerperium, 225
inversion of, 206
involution of, 117, 225
method of packing, 218
neck of, 32
of pregnancy, 62
openings into, 33
rupture of, 205
subinvolution of, 225

Vagina, 29
after labor, 226
in puerperium, 226
secretion of, 29
Vaginal discharge in infancy, 307
examination, 156
preparation for, 156
douche, 243
Varicose veins, 76
symptoms of, 77
treatment of, 77
Vegetations, umbilical, 308
Ventilation of incubator, 292
of lying-in room, 246
of nursery, 276, 285
Vernix caseosa, 51
Version, 177
anæsthesia in, 179, 180
bipolar, 178
Braxton-Hicks, 178

Version, combined, 178
dangers of, 180
external, 178
indications for, 184
internal, 180
preparations for, 179
Vertex presentation, 131
mechanism of, 131
Vesical tenesmus, 69
Visitors to infant, 285
to patient, 246
to premature infant, 294
Vomiting after nursing, 317
late in pregnancy, 74
of pregnancy, 71, 99
pernicious, 72
severe types of, 72
Vulva, 29
Vulva after labor, 226
in puerperium, 226
pads, 124

Walcher posture, 182
Walking, 107, 109
Weight of normal infant, 51
of premature infant, 287, 295
Wet-nurse, 324
Wharton's jelly, 50
"Whites," 82
Withdrawal of catheter, 242
Woollen-wear in pregnancy, 106
Womb. See *Uterus*, 29
Worry, effect on breast milk, 323

"Z-O" plaster, 307

THE END.

OCT 16 1909

LIBRARY OF CONGRESS
0 022 216 250 6